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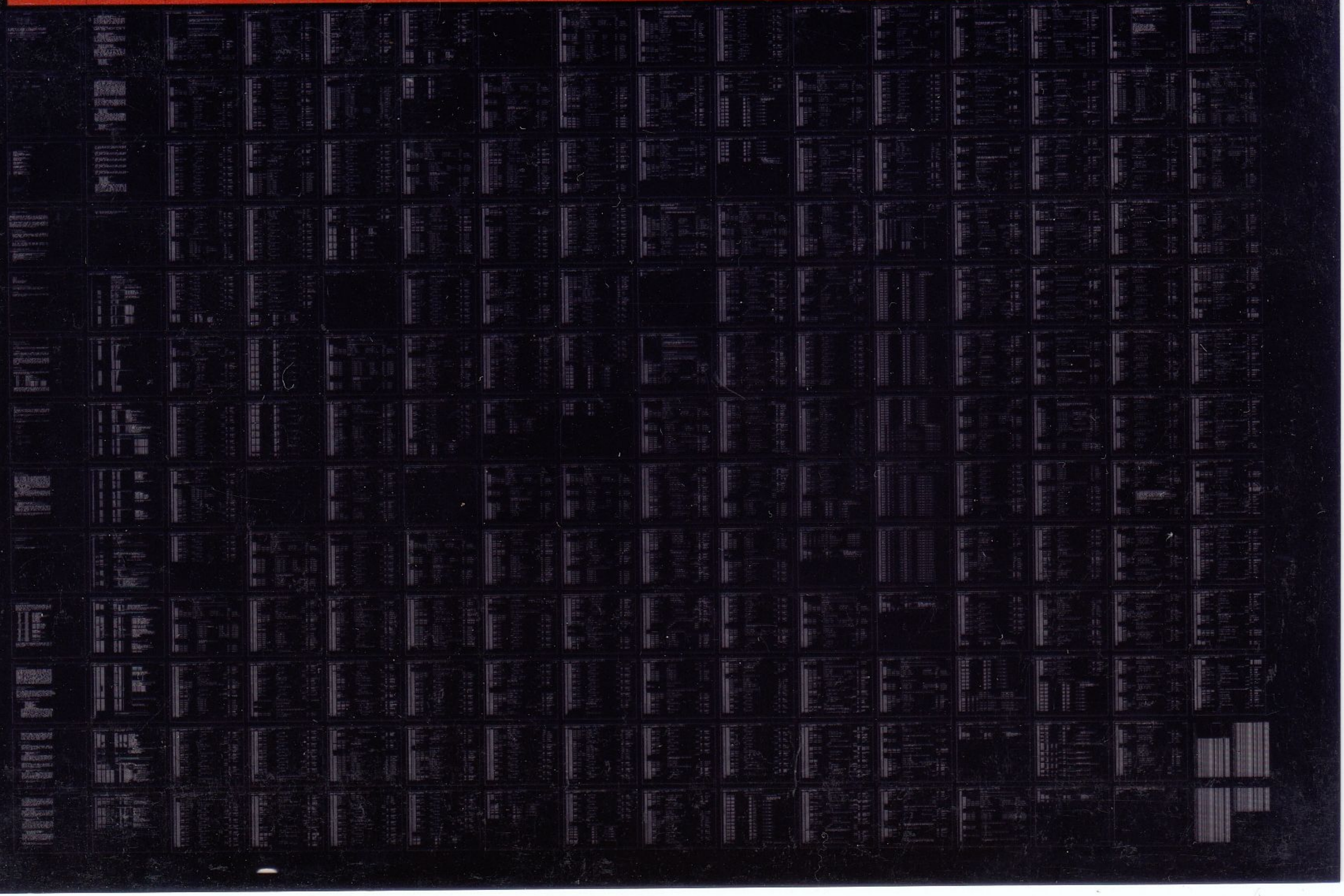

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IDENTIFICATION

PRODUCT CODE: AC-F972A-MC

PRODUCT NAME: CJKDGA0 KEF11-B CIS DIAG.

PRODUCT DATE: FEBRUARY 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

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HISTORY

REVISION	DATE	REASONS/CHANGES
A	DEC 1979	FIRST RELEASE

SEQ 0003

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1.0 GENERAL PROGRAM INFORMATION

1.1 ABSTRACT

THIS DIAGNOSTIC VERIFIES THE FUNCTIONALITY OF THE KEF11-BA (CIS - COMMERCIAL INSTRUCTION SET) OPTION. IT ALLOWS THE USER TO CHECK OUT ANY COMBINATION OF CIS CHIPS. IN VIRTUALLY ALL CASES, FAULT ISOLATION IS TO THE CIS CHIP LEVEL. THE DIAGNOSTIC CAN BE RUN UNDER XXDP, ACT, AND APT MONITORS. THE SOFTWARE SWITCH REGISTER (LOCATION 176) IS USED.

THE CIS OPTION CONSISTS OF SIX MOS/LSI CONTROL CHIPS CONTAINED IN THREE 40-PIN HYBRID CARRIERS. ALL CIS INSTRUCTIONS ARE CHIP PARTITIONED, I.E. ALL THE CODE FOR A PARTICULAR INSTRUCTION IS CONTAINED ON A PARTICULAR CONTROL CHIP. THE EXCEPTION IS THAT ALL CIS INSTRUCTIONS MUST PASS THROUGH THE FIRST CIS CHIP (CONTROL CHIP DC303-004) BEFORE REACHING THEIR DESTINATION CHIP.

1.2 SYSTEM REQUIREMENTS

A. HARDWARE REQUIREMENTS

THIS DIAGNOSTIC IS DESIGNED TO RUN ON A SYSTEM IMPLEMENTING A DCF11-AA CHIP SET. ALSO REQUIRED ARE A SERIAL LINE INTERFACE, A CONSOLE TERMINAL, AND 16K OF MEMORY. THE FIRST CIS CHIP (DC303-004) MUST BE INSTALLED. ANY (OR NONE) OF THE OTHER CIS CHIPS MAY BE PRESENT.

B. SOFTWARE REQUIREMENTS

THE SOFTWARE ENVIRONMENTS UNDER WHICH THIS DIAGNOSTIC WILL OPERATE ARE APT SCRIPT, APT STAND-ALONE, ACT Q.V., ACT AUTO-ACCEPT, ACT STAND-ALONE, XXDP CHAIN, XXDP STAND-ALONE, AND ABSOLUTE BINARY PAPER TAPE.

1.3 RELATED DOCUMENTS AND STANDARDS

THE FOLLOWING DOCUMENTS WERE USED OR REFERENCED DURING THE CREATION OF THIS DIAGNOSTIC:

DIAGNOSTIC ENGINEERING STANDARDS AND CONVENTIONS PROGRAMMING PRACTICES (DOC. NO. 175-003-009-02)
ACT11/XXDP PROGRAMMING SPECIFICATION (AUTOCAT-11-QZAUB-B-D)
BIC/BIN EXTENSION LIST
STANDARD APT SYSTEM TO PDP-11 DIAGNOSTIC INTERFACE (#APT/11-317-07-09)
DEC STD 168: PDP11 EXTENDED INSTRUCTIONS
CIS4.LIS
CIS5.LIS

CIS6.LIS
CIS7.LIS
CIS8.LIS
CIS9.LIS
CONTROL CHIP SPECIFICATION
DATA CHIP SPECIFICATION
SPMAC REFERENCE MANUAL

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

IT IS ASSUMED THAT THE CPU, MEMORY, SERIAL LINE INTERFACE, AND CONSOLE TERMINAL HAVE ALL PASSED THE PROPER DIAGNOSTICS.

1.5 ASSUMPTIONS

THE DIAGNOSTIC WILL ATTEMPT TO TEST ALL SIX CIS CHIPS UNLESS THE SOFTWARE SWR IS ALTERED TO INDICATE A SUBSET OF CIS CHIPS TO BE TESTED. SEE SECTION 2.2.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURE

A. LOADING

USE STANDARD LOADING PROCEDURE FOR PDP-11 ABSOLUTE BINARY PAPER TAPES; OR XXDP MEDIA (FILES WITH .BIC OR .BIN EXTENSIONS ONLY).

B STARTING

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200. UPON START UP (RUNNING IN NON-AUTOMATIC MODE) THE DIAGNOSTIC INITIALIZES, PRINTS OUT ITS IDENTIFICATION (FIRST TIME ONLY), AND THEN PRINTS:

''SWR = 000000 NEW - ''

THE NUMBER FOLLOWING ''SWR'' IS THE CURRENT VALUE OF THE SOFTWARE SWITCH REGISTER. IF NO CHANGES ARE DESIRED IN THE SWITCH REGISTER THEN A CARRIAGE RETURN MAY BE HIT; IF CHANGES ARE DESIRED THEN A NEW VALUE MAY BE TYPED IN FOLLOWED BY A CARRIAGE RETURN. IF NOT ALL SIX CIS CHIPS ARE TO BE TESTED THEN THE SWR WILL HAVE TO BE CHANGED. SEE NEXT SECTION FOR SWR BIT ASSIGNMENTS.

2.2 PROGRAM OPTIONS

SWITCH REGISTER SETTINGS

LOCATION 176 IS USED FOR THE SOFTWARE SWITCH REGISTER (UNLESS RUNNING UNDER APT SCRIPT MODE). THE FOLLOWING ARE THE RESULTS OF SETTING THE RESPECTIVE SWR BITS:

BIT15	-HALT ON ERROR	
BIT14	-SCOPE LOOP	
BIT13	-INHIBIT ERROR TYPEOUT	
BIT12	-NOT USED	
BIT11	-INHIBIT SUBTEST ITERATIONS	
BITS<10:6>	-NOT USED	
BIT05	-TEST CIS CONTROL CHIP 9	(DC303-009)
BIT04	-TEST CIS CONTROL CHIP 8	(DC303-008)
BIT03	-TEST CIS CONTROL CHIP 7	(DC303-007)
BIT02	-TEST CIS CONTROL CHIP 6	(DC303-006)
BIT01	-TEST CIS CONTROL CHIP 5	(DC303-005)
BIT00	-TEST CIS CONTROL CHIP 4	(DC303-004)

AS CAN BE SEEN ABOVE, SWR BITS<5:0> ALLOW THE USER TO SELECT ANY COMBINATION OF CIS CONTROL CHIP(S) TO BE TESTED. TO SELECT A CIS CONTROL CHIP FOR TESTING, ITS CORRESPONDING BIT IN THE SWITCH REGISTER MUST BE SET. NOTE, HOWEVER, THAT IF SWR BITS<5:0> ARE ALL ZERO (DEFAULT MODE) THEN THE DIAGNOSTIC WILL TEST ALL SIX CIS

CONTROL CHIPS.

THE VALUE OF THE SOFTWARE SWITCH REGISTER MAY BE CHANGED DURING THE PROGRAM RUN. TO DO THIS A CONTROL/G IS TYPED (TYPE THE 'CTRL' AND 'G' KEYS SIMULTANEOUSLY); WITHIN A FEW SECONDS THE CURRENT VALUE OF THE SWR IS TYPED OUT AND THE PROGRAM WAITS FOR NEW INPUT.

NOTE: THE PROGRAM IS NOT RUNNING ANY TESTS WHILE WAITING FOR A NEW VALUE OF SWR TO BE INPUT.

2.3 EXECUTION TIMES

ALL TIMES WERE MEASURED ON A KDF11-A, RUNNING THE FULL COMPLEMENT OF CIS CONTROL CHIPS.

A. FIRST PASS (QV)

10 SECONDS

B. LONGEST TEST

13 SECONDS

C. ADDITIONAL TIME FOR UNITS

N/A

D. FULL PASS TIME (ITERATIONS)

70 SECONDS

3.0 ERROR INFORMATION

3.1 ERROR REPORTING PROCEDURES

WHEN A CIS INSTRUCTION FAILS, THE TYPEOUT GIVES THE ERROR PC, THE CONTROL CHIP NUMBER, AND WHAT KIND OF FAILURE OCCURRED. THE ERROR PC IS THE ACTUAL LOCATION OF THE ERROR CALL IN THE FAILING SUBTEST. THE CONTROL CHIP NUMBER REFERS TO WHICH CONTROL CHIP WAS BEING TESTED WHEN THE ERROR OCCURRED. THE CONTROL CHIP NUMBER WILL APPEAR AS 23-*04, 23-*05, 23-*06, 23-*07, 23-*08, OR 23-*09. THE * SIGNIFIES THE REVISION LEVEL OF THE CHIP AND SO MAY BE ANY DIGIT. THE LAST TWO DIGITS DISTINGUISHES ONE CIS CHIP FROM ANOTHER. CURRENTLY, THE SIX CIS CONTROL CHIPS ARE PACKAGED ON THREE HYBRID CARRIERS. THE PART NUMBERS FOR THE HYBRID ASSEMBLIES ARE: 5700002-00 (CIS CHIPS 23-*04 AND 23-*06), 5700003-00 (CIS CHIPS 23-*05 AND 23-*07) AND 5700004-00 (CIS CHIPS 23-*08 AND 23-*09). THE KINDS OF FAILURES REPORTED ARE:

''CIS INSTRUCTION FAILURE''
''CIS INTERRUPT FAILURE''
'NO TRAP ON ILLEGAL CIS CLASS OPCODE''

THE ''CIS INSTRUCTION FAILURE'' IS THE MOST FREQUENTLY CALLED ERROR. IT USUALLY REFERS TO A CIS INSTRUCTION THAT PRODUCES THE WRONG CONDITION CODES, THE WRONG DESTINATION OUTPUT, OR THE WRONG GENERAL PURPOSE REGISTER CONTENTS. TO DETERMINE WHAT THE SPECIFIC FAILING INSTRUCTION IS, AND THE SPECIFIC TYPE OF FAILURE, LOOK IN THE DIAGNOSTIC AT THE CODE IN THE AREA OF THE ERROR PC.

3.2 ERROR HALTS

THREE UNEXPECTED FAULTS CAN ALSO OCCUR. THEY ARE:

''AN UNEXPECTED TIME-OUT TRAP''
''AN UNEXPECTED ILLEGAL AND RESERVED INSTRUCTION TRAP''
'POWER FAIL''

IN ALL THREE CASES THE PROGRAM HALTS IMMEDIATELY AFTER TYPING OUT THE APPROPRIATE MESSAGE. HITTING 'P'' (PROCEED) WILL CAUSE THE DIAGNOSTIC TO START OVER IF THE FAULT WAS A POWER FAIL, AND TO CONTINUE THE DIAGNOSTIC FROM THE POINT AT WHICH IT WAS INTERRUPTED FOR THE OTHER TWO FAULTS. ANY OTHER UNEXPECTED INTERRUPTS OR TRAPS WILL BE CAUGHT BY THE TRAP CATCHER, WHICH ALSO HALTS THE DIAGNOSTIC.

SETTING SWR BIT15 WILL CAUSE THE THREE ERRORS LISTED IN SECTION 3.1 TO HALT AFTER TYPING OUT THE ERROR MESSAGE. HITTING 'P'' (PROCEED) WILL CONTINUE THE DIAGNOSTIC.

SEQ 0009

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

N/A

4.2 PROGRESS REPORTS

AT THE END OF EACH PASS THE DIAGNOSTIC PRINTS OUT 'END PASS #'' FOLLOWED BY THE CURRENT PASS NUMBER.

5.0 DEVICE INFORMATION TABLES

THE CIS INSTRUCTIONS ARE PARTITIONED SUCH THAT NEARLY ALL THE MICRO-CODE FOR AN INSTRUCTION IS LOCATED ON ONE CHIP. (THE INSTRUCTIONS THAT RESIDE ON CONTROL CHIP DC303-004 ARE CONTAINED ENTIRELY ON THAT CHIP; ALL THE OTHER INSTRUCTIONS MUST FIRST PASS THROUGH CONTROL CHIP 4 SO THERE IS A SMALL AMOUNT OF MICRO-CODE FOR THE OTHER INSTRUCTIONS ON THAT CHIP.) THE PARTITIONING IS AS FOLLOWS:

CONTROL CHIP DC303-004:		
L2DR	07602R	LOAD 2 DESCRIPTORS
L3DR	07606R	LOAD 3 DESCRIPTORS
MOVC	076030	MOVE CHARACTER
MOVCR	076031	MOVE REVERSE JUSTIFIED CHARACTER
MOVTC	076032	MOVE TRANSLATED CHARACTER
LOCC	076040	LOCATE CHARACTER
SKPC	076041	SKIP CHARACTER
SCANC	076042	SCAN CHARACTER
SPANC	076043	SPAN CHARACTER
CMPC	076044	COMPARE CHARACTER
MATC	076045	MATCH CHARACTER
CONTROL CHIP DC303-005:		
CVTNL	076053	CONVERT NUMERIC TO LONG
CVTPN	076054	CONVERT PACKED TO NUMERIC
CVTNP	076055	CONVERT NUMERIC TO PACKED
CVTLN	076057	CONVERT LONG TO NUMERIC
CVTPL	076073	CONVERT PACKED TO LONG
CVTLP	076077	CONVERT LONG TO PACKED
CONTROL CHIP DC303-006:		
ADDN	076050	ADD NUMERIC
SUBN	076051	SUBTRACT NUMERIC
CMPN	076052	COMPARE NUMERIC
ASHN	076056	ARITHMETIC SHIFT NUMERIC
CONTROL CHIP DC303-007:		
ADDP	076070	ADD PACKED
SUBP	076071	SUBTRACT PACKED
CMPP	076072	COMPARE PACKED
ASHP	076076	ARITHMETIC SHIFT PACKED
CONTROL CHIP DC303-008:		
MULP	076074	MULTIPLY PACKED
CONTROL CHIP DC303-009:		
DIVP	076075	DIVIDE PACKED

ALL OF THE ABOVE INSTRUCTIONS EXCEPT FOR L2DR AND L3DR HAVE AN IN-LINE VERSION, TOO. THE MNEMONIC IS THE SAME EXCEPT AN "I" IS APPENDED TO IT AND THE OPCODE IS THE SAME EXCEPT BIT06 IS SET. FOR EXAMPLE, THE IN-LINE VERSION OF CVTNP (076055) IS CVTNPI (076155).

6.0 PROGRAM DESCRIPTION

THIS PROGRAM WAS WRITTEN IN MODULES. THE FIRST MODULE INCLUDES START UP AND INITIALIZATION ROUTINES, BASIC DEFINITIONS, VARIABLE DEFINITIONS, THE TRAP CATCHER, AND ACT AND APT INFORMATION. THE SECOND MODULE CONTAINS THE TESTS FOR THE CONTROL CHIP DC303-004 INSTRUCTIONS, THE TEST DATA FOR THOSE INSTRUCTIONS, AN ILLEGAL OPCODE TEST, AND AN INTERRUPTABILITY TEST. THE THIRD MODULE CONTAINS THE TESTS AND TEST DATA FOR CONTROL CHIP DC303-005 INSTRUCTIONS, A SUBROUTINE TO CONVERT LONG INTEGER TO AN INTERMEDIATE FORM, AND A SUBROUTINE TO CONVERT FROM THE INTERMEDIATE FORM TO LONG INTEGER. THE FOURTH MODULE CONTAINS THE TESTS FOR CONTROL CHIP DC303-006 INSTRUCTIONS. THE TESTS FOR CONTROL CHIP DC303-007 ARE IN THE FIFTH MODULE. THE SIXTH MODULE HAS THE TESTS AND TEST DATA FOR CONTROL CHIPS DC303-008 AND DC303-009. FINALLY, THE SEVENTH MODULE CONTAINS END OF PASS, SCOPE, ALL THE OTHER COMMON SUBROUTINES, ASCII MESSAGES, BUFFERS, TABLES, AND TEST DATA FOR CONTROL CHIPS DC303-006 AND DC303-007.

6.1 PROGRAM EXECUTION CHARACTERISTICS

6.2 SUBTEST SUMMARIES

THERE IS ONE SUBTEST FOR EACH CIS INSTRUCTION. FIRST, THE REGISTER FORM OF THE INSTRUCTION IS TESTED WITH SEVERAL SETS OF DATA. THEN ONE CASE OF THE IN-LINE VERSION IS TESTED. THE TEST DATA FOR THE REGISTER FORM IS IN TABLES. THE FIRST WORD OF EACH TABLE IS THE NUMBER OF TEST CASES CONTAINED IN THE TABLE. THE FORMAT OF THE TEST DATA IS DIFFERENT FOR DIFFERENT INSTRUCTIONS; THE FIRST TEST CASE IN EACH TABLE HAS COMMENTS IDENTIFYING EACH ELEMENT IN THE TEST CASE.

THE FOLLOWING IS A SUMMARY OF EACH SUBTEST.

MOVC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<SOURCE ADDRESS>
<DESTINATION LENGTH>
<DESTINATION ADDRESS>
<FILL CHARACTER>
<SOURCE BUFFER STATE>
<DESTINATION BUFFER STATE>

THE SOURCE AND DESTINATION BUFFER STATES DESIGNATE WHAT THOSE BUFFERS WILL BE FILLED WITH BEFORE EXECUTION OF THE MOVC INSTRUCTION. A '0' INDICATES EACH BYTE WILL CONTAIN 000, A '-1' INDICATES 377, AND A '1' INDICATES 252 (ALTERNATING 1'S AND 0'S BIT PATTERN). AN EXPECTED DESTINATION RESULT IS COMPUTED, AS WELL AS EXPECTED CONDITION CODES AND VALUES OF R0-R5. THEN THE MOVC INSTRUCTION IS EXECUTED AND THE ACTUAL RESULTS ARE COMPARED WITH THE EXPECTED RESULTS. DISAGREEMENTS ARE FLAGGED WITH AN ERROR CALL, WHICH PRINTS OUT 'CIS

INSTRUCTION FAILURE', THE PC OF THE ERROR CALL AND THE CONTROL CHIP NUMBER (IN THIS CASE, CONTROL CHIP NUMBER DC303-004). THIS WHOLE PROCEDURE IS REPEATED FOR EACH TEST CASE IN THE TABLE. THEN ONE SIMPLE IN-LINE CASE IS TESTED. THE DATA FOR THE IN-LINE CASE FOLLOWS THE TABLE OF TEST CASES FOR THE REGISTER FORM OF MOVC, AND IT CONTAINS ONLY: SOURCE LENGTH, SOURCE ADDRESS, DESTINATION LENGTH, AND DESTINATION ADDRESS.

MOVRC - SAME AS MOVC

MOVTC - SAME AS MOVC,
EXCEPT THAT A TRANSLATION TABLE, LOCATED AT 'TRANS', IS USED. PRIOR TO THE EXECUTION OF THE MOVTC INSTRUCTION, THE TRANSLATION TABLE IS CLEARED. THEN BYTE LOCATION TRANS+0 GETS A 63, TRANS+252 GETS A 314, AND TRANS+377 GETS A 125 (ALL NUMBERS OCTAL).

LOCC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<CHARACTER SEARCHED FOR>
<OFFSET>
THE SEARCH BUFFER (BUFF1) IS FILLED WITH ZEROES, THEN AT BYTE LOCATION 'BUFF1+OFFSET' THE 'CHARACTER SEARCHED FOR' IS INSERTED. EXPECTED RESULTS FOR THE CONDITION CODES AND R0-R5 ARE COMPUTED. THE LOCC INSTRUCTION IS EXECUTED AND EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS. DISAGREEMENTS ARE FLAGGED WITH ERROR CALLS.

SKPC - SIMILAR TO LOCC,
EXCEPT THAT THE TEST CASES HAVE A 'NOT SEARCHED FOR CHARACTER' IN PLACE OF A 'CHARACTER SEARCHED FOR'. THE SEARCH BUFFER (BUFF1) IS FILLED WITH SEARCHED-FOR CHARACTERS, THEN AT BYTE LOCATION 'BUFF1+OFFSET' THE 'NOT SEARCHED FOR' CHARACTER IS INSERTED.

SCANC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<OFFSET>
BUFF1 IS FILLED WITH ZEROES THAN AT BYTE LOCATION 'BUFF1+OFFSET' A 125 IS INSERTED. THE TABLE 'CHRSET IS CLEARED, THEN A 1 IS INSERTED AT BYTE LOCATION 'CHRSET+125', TO DENOTE MEMBERSHIP IN THE CHARACTER SET. EXPECTED CONDITION CODES AND R0-R5 VALUES ARE COMPUTED, THE SCANC INSTRUCTION IS EXECUTED, AND DISAGREEMENTS BETWEEN ACTUAL AND EXPECTED RESULTS CAUSE ERROR CALLS.

SPANC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>

<OFFSET>
BUFF1 IS FILLED WITH ZEROES, THEN A 252 IS INSERTED AT BYTE LOCATION 'BUFF1+OFFSET'. CHRSET IS FILLED WITH ZEROES, THEN BYTE LOCATION 'CHRSET+0' GETS A 40 SO THAT A 0 IN THE SOURCE BUFFER WILL BE CONSIDERED A MEMBER OF THE CHARACTER SET AND A 252 WILL NOT. EXPECTED CONDITION CODES AND R0-R5 VALUES ARE COMPUTED, SCANC IS EXECUTED, EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS, AND DISAGREEMENTS CAUSE ERROR CALLS.

CMPC - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE2 LENGTH>
BOTH SOURCE STRINGS ARE FILLED WITH 377'S AND THE FILL CHARACTER IS SET EQUAL TO 377. THEN IN THE LONGER STRING, AT 'SRC.ADR+OFFSET', A BYTE IS CLEARED. THIS BYTE WILL BE THE INEQUALITY BETWEEN THE TWO STRINGS WHICH WILL TERMINATE THE CMPC COMPARISON. ACTUAL RESULTS WILL BE COMPARED WITH PREVIOUSLY COMPUTED EXPECTED RESULTS (CONDITION CODES AND R0-R5 VALUES).

MATC - THE TABLE OF TEST CASES CONTAINS:
<OBJECT LENGTH>
<OFFSET>
THE SOURCE STRING IS THE FIRST 70 BYTES OF BUFF1. BUFF1 IS FIRST FILLED WITH 377'S AND THEN CLEARED FROM 'BUFF1+OFFSET' TO THE END OF BUFF1. THE OBJECT STRING STARTS AT BUFF2, IS OF LENGTH 'OBJECT LENGTH' FROM THE TABLE OF TEST CASES, AND IS ALL ZEROES. EXPECTED VALUES OF CONDITION CODES AND R0-R5 ARE COMPUTED, MATC IS EXECUTED, EXPECTED RESULTS AND ACTUAL RESULTS ARE COMPARED, AND ERROR CALLS ARE MADE FOR DISAGREEMENTS.

CVTLP - THE TABLE OF TEST CASES CONTAINS:
<DESTINATION DATA TYPE AND LENGTH>
<LONG INTEGER HIGH, AND SIGN>
<LONG INTEGER LOW>
THE LONG INTEGER IN THE TEST CASE IS CONVERTED TO PACKED AND PLACED INTO BUFFER 'DS.EXP' (DECIMAL STRING EXPECTED) ACCORDING TO THE DESTINATION TYPE AND LENGTH SPECIFIED IN THE TABLE. THE EXPECTED VALUES OF THE CONDITION CODES AND R0-R5 ARE ALSO COMPUTED. THE CVTLP INSTRUCTION IS EXECUTED AND EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS. DISAGREEMENTS WILL CAUSE ERROR CALLS.

CVTLN - SAME AS THE CVTLP TEST,
EXCEPT THE LONG INTEGER IS CONVERTED TO A NUMERIC DECIMAL FORM, ACCORDING TO THE SPECIFICATION IN THE TEST CASE.

CVTPL - THE TABLE OF TEST CASES CONTAINS:

<SOURCE DATA TYPE AND LENGTH>
<POINTER TO PACKED DECIMAL STRING>
<A PACKED DECIMAL STRING>
THE PACKED DECIMAL STRING IS CONVERTED TO A LONG INTEGER AND THE RESULT IS PUT INTO 'R2.EXP' AND 'R3.EXP' (EXPECTED RESULTS FOR R2 AND R3). THE EXPECTED RESULTS FOR THE OTHER GENERAL PURPOSE REGISTER AND THE CONDITION CODES ARE ALSO COMPUTED. THE CVTPL INSTRUCTION IS EXECUTED, ACTUAL RESULTS ARE COMPARED WITH EXPECTED RESULTS, AND DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.

CVTNL - SAME AS THE CVTNL TEST,
EXCEPT THAT NUMERIC DECIMAL STRINGS ARE CONVERTED INSTEAD OF PACKED DECIMAL STRINGS. ALSO, A TABLE FOR INTERPRETING ACCEPTABLE SIGN/DIGIT COMBINATIONS FOR OVERPUNCH IS INCLUDED.

CVTPN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE DATA TYPE AND LENGTH>
<POINTER TO A PACKED SOURCE STRING>
<DESTINATION LENGTH>
EACH PACKED DECIMAL STRING IS CONVERTED INTO EACH OF THE SIX NUMERIC DECIMAL DATA TYPES. THUS, EACH TEST CASE IS USED SIX TIMES BEFORE GOING ON TO THE NEXT ONE. EACH TIME, THE EXPECTED CONDITION CODES AND R0-R5 VALUES ARE ALSO COMPUTED. THE CVTPN INSTRUCTION IS EXECUTED, EXPECTED RESULTS ARE COMPARED WITH ACTUAL RESULTS, AND DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.

CVTNP - THE TABLE OF TEST CASES CONTAINS:
<SOURCE DATA TYPE AND LENGTH>
<POINTER TO A SOURCE STRING>
<DESTINATION DATA TYPE AND LENGTH>
<A SOURCE STRING>
THE SOURCE STRING IS IN AN INTERMEDIATE FORMAT. THE FIRST WORD INDICATES THE SIGN (0 FOR POSITIVE, -1 FOR NEGATIVE). FOLLOWING THAT IS THE MAGNITUDE, ONE BINARY-CODED-DECIMAL DIGIT PER BYTE. THE SOURCE IS CONVERTED TO A PACKED DECIMAL STRING AND PUT INTO 'DS.EXP', AND THE EXPECTED VALUES OF THE CONDITION CODES AND R0-R5 ARE COMPUTED. THE CVTNP INSTRUCTION IS EXECUTED, ACTUAL RESULTS COMPARED WITH EXPECTED RESULTS, AND DISAGREEMENTS FLAGGED BY ERROR CALLS.

ADDN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE1 POINTER>
<SOURCE2 LENGTH>
<SOURCE2 POINTER>
<DESTINATION LENGTH>
<DESTINATION POINTER (SUM)>

<EXPECTED CONDITION CODES>
THE SOURCE1, SOURCE2, AND DESTINATION STRINGS ARE IN AN INTERMEDIATE FORMAT. EACH ONE IS TESTED IN FIVE OF THE SIX DATA TYPE FORMATS (UNSIGNED ZONED IS TESTED IN THE INLINE CASE ONLY). THIS GIVES A TOTAL OF 125 TESTS PERFORMED ON EACH TEST CASE, IN ORDER TO TEST ALL COMBINATIONS OF THE FIVE DATA TYPES. SOURCE1 AND SOURCE2 ARE ADDED TOGETHER BY THE ADDN INSTRUCTION AND THE ANSWER IS COMPARED TO THE EXPECTED ANSWER WHICH IS SUPPLIED IN THE TEST TABLE (POINTED TO BY THE DESTINATION POINTER). EXPECTED CONDITION CODES ARE ALSO [illegible]IED IN THE TEST CASE TABLE AND IS COMPARED WITH [illegible]E ACTUAL CONDITION CODES. THE EXPECTED GENERAL PURPOSE REGISTER VALUES (R0-R5) ARE THE ONLY EXPECTED RESULTS THAT ARE ACTUALLY CALCULATED BY THE DIAGNOSTIC, AND THESE TOO ARE COMPARED WITH THE ACTUAL RESULTS. ANY DISAGREEMENTS BETWEEN ACTUAL AND EXPECTED RESULTS ARE FLAGGED BY AN ERROR CALL.

SUBN - THE SAME AS ADDN,
EXCEPT THAT THE TEST CASES HAVE THE EXPECTED DESTINATION STRING (IN AN INTERMEDIATE FORMAT) AND EXPECTED CONDITION CODES FOR A SUBTRACT OPERATION INSTEAD OF AN ADD OPERATION. THE SOURCE1 LENGTH AND POINTER, THE SOURCE2 LENGTH AND POINTER, AND THE DESTINATION LENGTH ARE IDENTICAL TO THOSE USED IN THE ADDN INSTRUCTION. THE TEST OPERATES IN EXACTLY THE SAME MANNER AS THE ADDN TEST.

CMPN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE1 POINTER>
<SOURCE2 LENGTH>
<SOURCE2 POINTER>
THE TWO SOURCE STRINGS ARE IN AN INTERMEDIATE FORMAT. EACH ONE IS TESTED IN FIVE OF THE SIX NUMERIC DATA TYPE FORMATS (UNSIGNED ZONED IS TESTED IN THE INLINE CASE ONLY). THIS GIVES A TOTAL OF 25 TESTS PERFORMED ON EACH TEST CASE. IN EACH TEST, SOURCE1 IS ARITHMETICALL. COMPARED WITH SOURCE2 AND THE CONDITIONS ARE UPDATED TO REFLECT THE RESULTS. THE EXPECTED CONDITION CODES ARE COMPARED WITH THE ACTUAL CONDITION CODES, AND R0-R5 ARE TESTED TO SEE THAT THEY ARE CLEAR. ANY DISCREPANCIES ARE FLAGGED BY ERROR CALLS.

ASHN - THE TABLE OF TEST CASES CONTAINS:
<SOURCE LENGTH>
<DESTINATION LENGTH>
<SHIFT COUNT>
<ROUNDING DIGIT>
THE SOURCE STRING IS ALWAYS A STRING OF "4"S STARTING AT DSBUF1 AND OF THE LENGTH SPECIFIED BY THE TEST

CASE. EACH TIME, THE EXPECTED RESULTS ARE CALCULATED AND PUT INTO DS.EXP AND CC.EXP. ACTUAL RESULTS ARE COMPARED WITH EXPECTED RESULTS AND DISAGREEMENTS ARE FLAGGED BY ERROR CALLS.

ADDP - SAME AS THE ADDN TEST, EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR ADDN IS USED HERE.

SUBP - SAME AS THE SUBN TEST, EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR SUBN IS USED HERE.

CMPP - SAME AS THE CMPN TEST, EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR CMPN IS USED HERE.

ASHP - SAME AS THE ASHN TEST, EXCEPT THAT EACH TEST CASE IS RUN ONCE, USING SIGNED PACKED FORMAT. UNSIGNED PACKED IS TESTED IN THE IN-LINE TEST. THE IDENTICAL TABLE OF TEST CASES USED FOR ASHN IS USED HERE.

MULP - THE TABLE OF TEST CASES CONTAINS:
<SOURCE1 LENGTH>
<SOURCE1 POINTER>
<SOURCE2 LENGTH>
<SOURCE2 POINTER>
<DESTINATION LENGTH>
<DESTINATION POINTER (PRODUCT)>
<CC.EXP (PRODUCT)>
THE TWO SOURCES (MULTIPLIER AND MULTIPLICAND) AND EXPECTED DESTINATION (PRODUCT) ARE IN THE TABLE OF TEST CASES, IN INTERMEDIATE FORMAT. THE TWO SOURCES ARE MULTIPLIED TOGETHER (IN SIGNED PACKED FORMAT) AND THE EXPECTED PRODUCT IS COMPARED WITH THE ACTUA RESULT. ALSO, THE EXPECTED VALUES OF R0-R5 AND THE CONDITION CODES ARE COMPARED WITH THE ACTUAL RESULTS. ANY DISCREPANCIES ARE FLAGGED BY ERROR CALLS. UNSIGNED PACKED FORMAT IS TESTED IN THE INLINE CASE ONLY.

DIVP - SAME AS THE MULP TEST,

EXCEPT THAT A DIVP IS EXECUTED AND THE TABLE OF TEST CASES CONTAINS QUOTIENT RESULTS FOR THE LAST TWO TABLE ENTRIES (DESTINATION POINTER AND CC.EXP).

6.3 SPECIAL SUBROUTINE DESCRIPTION

7.0 LISTING

```
                                ;*COPYRIGHT (C) 1980
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY RICHARD KIMBALL  &  DONALD SOBIK
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING SPMAC
                                ;*
                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 776 ***
000776                          STACK=  776
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177546                          LKS=    177546          ;;LINE CLOCK STATUS REGISTER
000100                          BUFLEN= 100             ;LENGTH OF BUFF1 AND BUFF2

                                ;*CONSOLE REGISTER DEFINITIONS
177560                          TKS=    177560
177562                          TKB=    177562
177564                          TPS=    177564
177566                          TPB=    177566

                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
000007                          R7=     %7              ;;GENERAL REGISTER
000006                          SP=     %6              ;;STACK POINTER
000007                          PC=     %7              ;;PROGRAM COUNTER

                                ;*PRIORITY LEVEL DEFINITIONS
000000                          PR0=    0               ;;PRIORITY LEVEL 0
000040                          PR1=    40              ;;PRIORITY LEVEL 1
000100                          PR2=    100             ;;PRIORITY LEVEL 2
000140                          PR3=    140             ;;PRIORITY LEVEL 3
000200                          PR4=    200             ;;PRIORITY LEVEL 4
000240                          PR5=    240             ;;PRIORITY LEVEL 5
000300                          PR6=    300             ;;PRIORITY LEVEL 6
000340                          PR7=    340             ;;PRIORITY LEVEL 7

                                ;*CONDITION CODE EQUATES
000010                          NBIT=   10
```

```
                        ZBIT=   4
                        VBIT=   2
                        CBIT=   1

                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
020000                  SW13=   20000
010000                  SW12=   10000
004000                  SW11=   4000
002000                  SW10=   2000
001000                  SW09=   1000
000400                  SW08=   400
000200                  SW07=   200
000100                  SW06=   100
000040                  SW05=   40
000020                  SW04=   20
000010                  SW03=   10
000004                  SW02=   4
000002                  SW01=   2
000001                  SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                  BIT15=  100000
040000                  BIT14=  40000
020000                  BIT13=  20000
010000                  BIT12=  10000
004000                  BIT11=  4000
002000                  BIT10=  2000
001000                  BIT09=  1000
000400                  BIT08=  400
000200                  BIT07=  200
000100                  BIT06=  100
000040                  BIT05=  40
000020                  BIT04=  20
000010                  BIT03=  10
000004                  BIT02=  4
000002                  BIT01=  2
000001                  BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
```

```
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC ''CPU'' TRAP VECTOR ADDRESSES
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;''T'' BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT)
000034                  TRAPVEC=34              ;;''TRAP'' TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000100                  LTCVEC= 100             ;;LTC VECTOR
000000                  ASWREG  =0              ;INITIAL APT SOFTWARE SWR VALUE


                        ;*EQUATES FOR ROUTINE CALLS THAT USE TRAP INSTRUCTION
104401                  TYPE=   104401          ;TTY TYPEOUT ROUTINE
104402                  TYPOC=  104402          ;TYPE OCTAL NUMBER (WITH LEADING ZEROES) ROUTINE
104403                  TYPOS=  104403          ;TYPE OCTAL NUMBER (NO LEADING ZEROES) ROUTINE
104404                  TYPON=  104404          ;TYPE OCTAL NUMBER (AS PER LAST CALL) ROUTINE
104405                  GTSWR=  104405          ;GET SOFT-SWR SETTING ROUTINE
104406                  CKSWR=  104406          ;TEST FOR CHANGE IN SOFT-SWR ROUTINE
100407                  RDCHR=  100407          ;TTY TYPEIN CHARACTER ROUTINE
104410                  RDLIN=  104410          ;TTY TYPEIN STRING ROUTINE

                        ;;**********************************************************************
                        ;       *** COMMERCIAL INSTRUCTION SET OPCODE EQUATES ***
                        ;
000007                  MFPT    =000007                         ;MOVE FROM PROCESSOR TYPE

                        ;       COMMERCIAL LOAD DESCRIPTORS
076020                  L2D0    =76020                          ;LOAD 2 DESCRIPTORS @(R0)+
076021                  L2D1    =76021                          ;LOAD 2 DESCRIPTORS @(R1)+
076022                  L2D2    =76022                          ;LOAD 2 DESCRIPTORS @(R2)+
076023                  L2D3    =76023                          ;LOAD 2 DESCRIPTORS @(R3)+
076024                  L2D4    =76024                          ;LOAD 2 DESCRIPTORS @(R4)+
076025                  L2D5    =76025                          ;LOAD 2 DESCRIPTORS @(R5)+
076026                  L2D6    =76026                          ;LOAD 2 DESCRIPTORS @(R6)+
076027                  L2D7    =76027                          ;LOAD 2 DESCRIPTORS @(R7)+

076060                  L3D0    =76060                          ;LOAD 3 DESCRIPTORS @(R0)+
076061                  L3D1    =76061                          ;LOAD 3 DESCRIPTORS @(R1)+
076062                  L3D2    =76062                          ;LOAD 3 DESCRIPTORS @(R2)+
076063                  L3D3    =76063                          ;LOAD 3 DESCRIPTORS @(R3)+
076064                  L3D4    =76064                          ;LOAD 3 DESCRIPTORS @(R4)+
076065                  L3D5    =76065                          ;LOAD 3 DESCRIPTORS @(R5)+
076066                  L3D6    =76066                          ;LOAD 3 DESCRIPTORS @(R6)+
076067                  L3D7    -76067                          ;LOAD 3 DESCRIPTORS @(R7)+


                        ;       CHARACTER STRING INSTRUCTIONS
```

```
                076030          MOVC    =76030                  ;MOVE CHARACTER
                076031          MOVRC   =76031                  ;MOVE REVERSE CHARACTER
                076032          MOVTC   =76032                  ;MOVE TRANSLATED CHARACTER
                076040          LOCC    =76040                  ;LOCATE CHARACTER
                076041          SKPC    =76041                  ;SKIP CHARACTER
                076042          SCANC   =76042                  ;SCAN CHARACTER
                076043          SPANC   =76043                  ;SPAN CHARACTER
                076044          CMPC    =76044                  ;COMPARE CHARACTER
                076045          MATC    =76045                  ;MATCH CHARACTER

                076130          MOVCI   =76130                  ;IN-LINE VERSION OF MOVE CHARACTER
                076131          MOVRCI  =76131                  ;IN-LINE VERSION
                076132          MOVTCI  =76132                  ;       ''
                076140          LOCCI   =76140                  ;       ''
                076141          SKPCI   =76141                  ;       ''
                076142          SCANCI  =76142                  ;       ''
                076143          SPANCI  =76143                  ;       ''
                076144          CMPCI   =76144                  ;       ''
                076145          MATCI   =76145                  ;       ''


                                ;       NUMERIC STRING INSTRUCTIONS
                076050          ADDN    =76050                  ;ADD NUMERIC
                076051          SUBN    =76051                  ;SUBTRACT NUMERIC
                076052          CMPN    =76052                  ;COMPARE NUMERIC
                076053          CVTNL   =76053                  ;CONVERT NUMERIC TO LONG
                076054          CVTPN   =76054                  ;CONVERT PACKED TO NUMERIC
                076055          CVTNP   =76055                  ;CONVERT NUMERIC TO PACKED
                076056          ASHN    =76056                  ;ARITHMETIC SHIFT NUMERIC
                076057          CVTLN   =76057                  ;CONVERT LONG TO NUMERIC

                076150          ADDNI   =76150                  ;IN-LINE VERSION OF ADD NUMERIC
                076151          SUBNI   =76151                  ;IN-LINE VERSION
                076152          CMPNI   =76152                  ;       ''
                076153          CVTNLI  =76153                  ;       ''
                076154          CVTPNI  =76154                  ;       ''
                076155          CVTNPI  =76155                  ;       ''
                076156          ASHNI   =76156                  ;       ''
                076157          CVTLNI  =76157                  ;       ''


                                ;       PACKED STRING INSTRUCTIONS
                076070          ADDP    =76070                  ;ADD PA KED
                076071          SUBP    =76071                  ;SUBTRACT PACKED
                076072          CMPP    =76072                  ;COMPARE PACKED
                076073          CVTPL   =76073                  ;CONVERT PACKED TO LONG
                076074          MULP    =76074                  ;MULTIPLY PACKED
                076075          DIVP    =76075                  ;DIVIDE PACKED
                076076          ASHP    =76076                  ;ARITHMETIC SHIFT PACKED
                076077          CVTLP   =76077                  ;CONVERT LONG TO PACKED

                076170          ADDPI   =76170                  ;IN-LINE VERSION OF ADD PACKED
                076171          SUBPI   =76171                  ;IN-LINE VERSION
                076172          CMPPI   =76172                  ;       ''
                076173          CVTPLI  =76173                  ;       ''
                076174          MULPI   =76174                  ;       ''
```

```
                076175                  DIVPI   =76175                          ;       ''
                076176                  ASHPI   =76176                          ;       ''
                076177                  CVTLPI  =76177                          ;       ''


                                        ;       CIS CLASS ILLEGAL OPCODE
                076033                  ILLOP   =76033                          ;ILLEGAL OPCODE


                                        ;;**********************************************************************



                                        .SBTTL  TRAP CATCHER

                000000                          .-0
                                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ''.+2,HALT''
                                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                000174                          .=174
000174  000000                         DISPREG: .WORD  0                       ;;SOFTWARE DISPLAY REGISTER
000176  000000                         SWREG:   .WORD  0                       ;;SOFTWARE SWITCH REGISTER


                000100                          .-100           ;HANDLE EVENT LINE INTERRUPT
000100  000102                                  .WORD   102
000102  000002                                  .WORD   2

                000200                  .=200
000200  000137  001200                          JMP     START                   ;STARTING LOCATION FOR PROGRAM

                000300                  .=300
                                        .SBTTL  ACT11 HOOKS

                                        ;;**********************************************************************
                                        ;HOOKS REQUIRED BY ACT11
                000300                          $SVPC=.                 ;SAVE PC
                000046                          .=46
000046  055214                                  $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                000052                          .=52
000052  000000                                  .WORD   0               ;;2)SET LOC.52 TO ZERO
                000300                          .=$SVPC                 ;; RESTORE PC
                                        .SBTTL  APT PARAMETER BLOCK

                                        ;;**********************************************************************
                                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                        ;;**********************************************************************
                000300                          .$X=.   ;;SAVE CURRENT LOCATION
                000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                                  200     ;;FOR APT START UP
                000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  000300                                  $APTHDR ;;POINT TO APT HEADER BLOCK
                000300                          .=.$X   ;;RESET LOCATION COUNTER
                                        ;;**********************************************************************
                                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
```

APT PARAMETER BLOCK SEQ 0023

```
                                ;INTERFACE SPEC.

000300                          $APTHD:
000300  000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
000302  000630                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
000304  000300                 $TSTM:  .WORD   300     ;;RUN TIM OF LONGEST TEST
000306  000300                 $PASTM: .WORD   300     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
000310  000000                 $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
000312  177707                         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
                                .SBTTL  COMMON TAGS

                                ;;**********************************************************************
                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

        000400                          .=400
000400                          $CMTAG:                 ;;START OF COMMON TAGS
000400  000000                          .WORD   0
000402  000000                 $TSTNM: .WORD   0       ;;CONTAINS THE TEST NUMBER
000404  000000                 $TIMES: .WORD   0       ;;CONTAINS NUMBER OF ITERATIONS DESIRED
000406  000000                 $ICNT:  .WORD   0       ;;CONTAINS SUBTEST ITERATION COUNT
000410  000000                 $LPADR: .WORD   0       ;;CONTAINS SCOPE LOOP ADDRESS
000412  000000                 $LPERR: .WORD   0       ;;CONTAINS SCOPE RETURN FOR ERRORS
000414  000000                 $ERTTL: .WORD   0       ;;CONTAINS TOTAL ERRORS DETECTED
000416     001                 $ERMAX: .BYTE   1       ;;CONTAINS MAX. ERRORS PER TEST
        000420                  .EVEN
000420  000000                 $ERRPC: .WORD   0       ;;CONTAINS PC OF LAST ERROR INSTRUCTION
000422     000                 $AUTOB: .BYTE   0       ;;AUTOMATIC MODE INDICATOR
000423     000                 $INTAG: .BYTE   0       ;;INTERRUPT MODE INDICATOR
000424  000000                         .WORD   0
000426  000176                 SWR:    .WORD   SWREG   ;;ADDRESS OF SWITCH REGISTER
000430  000174                 DISPLAY: .WORD  DISPREG  ;;ADDRESS OF DISPLAY REGISTER
000432     000                 $NULL:  .BYTE   0       ;;CONTAINS NULL CHARACTER FOR FILLS
000433     002                 $FILLS: .BYTE   2       ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
000434     012                 $FILLC: .BYTE   12      ;;INSERT FILL CHARS. AFTER A 'LINE FEED''
000435     000                 $TPFLG: .BYTE   0       ;;'TERMINAL AVAILABLE'' FLAG (BIT<07>=0=YES)
000436  177607  000377         $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
000442     077                 $QUES:  .ASCII  /?/     ;;QUESTION MARK
000443     015                 $CRLF:  .ASCII  <15>    ;;CARRIAGE RETURN
000444  000012                 $LF:    .ASCIZ  <12>    ;;LINE FEED

000446                          $ETEND:

000446  000000                 SIGN0:  .WORD   0       ;SIGN FLAG:  0 FOR +, -1 FOR -
000450  000000                 SIGN1:  .WORD   0       ;     ''
000452  000000                 SIGN2:  .WORD   0       ;     ''
000454  000000                 ERRFLG: .WORD   0       ;ERROR FLAG
000456  000000                 INTFLG: .WORD   0       ;INTERRUPT FLAG
000460  000000                 INTPAS: .WORD   0       ;FLAGS FIRST PASS OF INTERRUPT TEST
000462  000000                 DATTYP: .WORD   0       ;DECIMAL STRING DATA TYPE FLAG
000464  000000                 XXDP:   .WORD   0       ;IF NOT 0 THEN WE ARE IN XXDP CHAIN MODE
000466  000000                 COUNT:  .WORD   0       ;TEMPORARY COUNTER
000470  000000                 DELAY:  .WORD   0       ;TIME-DELAY COUNT STORED HERE
000472  000000                 ERRTMP: .WORD   0
000474  000000                 TEMP0:  .WORD   0       ;TEMPORARY VARIABLE
000476  000000                 TEMP1:  .WORD   0       ;TEMPORARY VARIABLE
```

```
                                TEMP2:   .WORD   0              ;TEMPORARY VARIABLE
                                TEMP3:   .WORD   0              ;TEMPORARY VARIABLE
                                TEMP4:   .WORD   0              ;TEMPORARY VARIABLE
                                TEMP5:   .WORD   0              ;TEMPORARY VARIABLE
                                OFFSET:  .WORD   0
                                DSLEN1:  .WORD   0              ;FIRST DECIMAL STRING LENGTH
                                DSLEN2:  .WORD   0              ;SECOND DECIMAL STRING LENGTH
                                CC:      .WORD   0              ;CONDITION CODES MAY BE SAVED HERE
                                CC.EXP:  .WORD   0              ;EXPECTED CONDITION CODES
                                R0.EXP:  .WORD   0              ;EXPECTED VALUE OF R0
                                R1.EXP:  .WORD   0              ;                  R1
                                R2.EXP:  .WORD   0              ;                  R2
                                R3.EXP:  .WORD   0              ;                  R3
                                R4.EXP:  .WORD   0              ;                  R4
                                R5.EXP:  .WORD   0              ;                  R5
                                BF.EXP:  .WORD   0              ;EXPECTED BUFFER DATA
                                BFADRS:  .WORD   0              ;BUFFER POINTER
                                TSTCAS:  .WORD   0              ;POINTER TO CURRENT TEST CASE IN TEST TABLE
                                CTL:     .WORD   0              ;CONTROL CHIP NUMBER
                                MSGADR:  .WORD   0              ;ADDRESS OF THE ASCII TO BE PRINTED
                                ERR:     .WORD   0              ;ERROR TYPE NUMBER
                                DSTMP0:  .BYTE   0              ;DECIMAL STRING TEMPORARY
                                DSTMP1:  .BYTE   0              ;DECIMAL STRING TEMPORARY
                                DSTMP2:  .BYTE   0              ;DECIMAL STRING TEMPORARY
                                DSTMP3:  .BYTE   0              ;DECIMAL STRING TEMPORARY
                                DSTMP4:  .BYTE   0              ;DECIMAL STRING T-'PORARY
                                DSTMP5:  .BYTE   0              ;DECIMAL STRING TEMPORARY
                                DATA00:  .WORD   0              ;TEST DATA GETS LOADED HERE
                                DATA01:  .WORD   0              ;
                                DATA02:  .WORD   0              ;
                                DATA03:  .WORD   0              ;
                                DATA04:  .WORD   0              ;
                                DATA05:  .WORD   0              ;
                                DATA06:  .WORD   0              ;

                                SAVR0:   .WORD   0              ;GENERAL PURPOSE REGISTERS MAY BE SAVED HERE
                                SAVR1:   .WORD   0              ;
                                SAVR2:   .WORD   0              ;
                                SAVR3:   .WORD   0              ;
                                SAVR4:   .WORD   0              ;
                                SAVR5:   .WORD   0              ;
                                SAVPSW:  .WORD   0              ;PSW MAY BE SAVED HERE
                                DESCR0:  .WORD   0              ;TEMPS FOR DS DESCRIPTORS
                                DESCR1:  .WORD   0
                                DESCR2:  .WORD   0
                                DESCR3:  .WORD   0
                                DESCR4:  .WORD   0
                                DESCR5:  .WORD   0


                                ;;*******************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;*******************************************************************
                                ;
                                ;
```

```
                                    .EVEN
000630                              $MAIL:                          ;;APT MAILBOX
000630  000000                      $MSGTY: .WORD   000000          ;;MESSAGE TYPE CODE
000632  000000                      $FATAL: .WORD   000000          ;;FATAL ERROR NUMBER
000634  000000                      $TESTN: .WORD   000000          ;;TEST NUMBER
000636  000000                      $PASS:  .WORD   000000          ;;PASS COUNT
000640  000000                      $DEVCT: .WORD   000000          ;;DEVICE COUNT
000642  000000                      $UNIT:  .WORD   000000          ;;I/O UNIT NUMBER
000644  000000                      $MSGAD: .WORD   000000          ;;MESSAGE ADDRESS
000646  000000                      $MSGLG: .WORD   000000          ;;MESSAGE LENGTH
000650                              $ETABLE:                        ;;APT ENVIRONMENT TABLE
000650     000                      $ENV:   .BYTE   000             ;;ENVIRONMENT BYTE
000651     000                      $ENVM:  .BYTE   000             ;;ENVIRONMENT MODE BITS
000652  000000                      $SWREG: .WORD   000000          ;;APT SWITCH REGISTER
000654  000000                      $USWR:  .WORD   000000          ;;USER SWITCHES
000656  000000                      $CPUOP: .WORD   000000          ;;CPU TYPE,OPTIONS
                                    ;*                              BITS 15-11=CPU TYPE
                                    ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                    ;*                                      11/70=06,PDQ=07,Q=10
                                    ;*                              BIT 10=REAL TIME CLOCK
                                    ;*                              BIT  9=FLOATING POINT PROCESSOR
                                    ;*                              BIT  8=MEMORY MANAGEMENT
000660     000                      $MAMS1: .BYTE   000             ;;HIGH ADDRESS,M.S. BYTE
            000662                  .EVEN


                                    ;;*****************************************************************
                                    .SBTTL  START UP AND INITIALIZATION ROUTINES
                                    ;;*****************************************************************
            001200                  .=1200
001200                              START:

                                    .SBTTL  INITIALIZE THE COMMON TAGS
                                    ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
001200  012706  000400                      MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
001204  005026                      CLR     (R6)+           ;;CLEAR MEMORY LOCATION
001206  022706  000426              CMP     #SWR,R6 ;;DONE?
001212  001374                      BNE     .-6             ;;LOOP BACK IF NO
001214  012706  001100              MOV     #1100,SP        ;;SETUP THE STACK POINTER
                                    ;;INITIALIZE A FEW VECTORS
001220  012737  055300  000004              MOV     #TIMOUT,@#ERRVEC        ;TIME-OUT VECTOR
001226  012737  000340  000006              MOV     #340,@#ERRVEC+2         ;LEVEL 7
001234  012737  055314  000010              MOV     #ILLRES,@#RESVEC        ;ILLEGAL/RESERVED INSTR. VECTOR
001242  012737  000340  000012              MOV     #340,@#RESVEC+2         ;LEVEL 7
001250  012737  055770  000020              MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
001256  012737  000340  000022              MOV     #340,@#IOTVEC+2 ;;LEVEL 7
001264  012737  060356  000034              MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
001272  012737  000340  000036              MOV     #340,@#TRAPVEC+2;LEVEL 7
001300  012737  056110  000024              MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
001306  012737  000340  000026              MOV     #340,@#PWRVEC+2 ;;LEVEL 7
001314  013737  055232  055230              MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
001322  012737  001322  000410              MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
001330  012737  000102  000100              MOV     #102,@#LTCVEC           ;GO TO 102
001336  012737  000002  000102              MOV     #2,@#102                ;RTI
```

INITIALIZE THE COMMON TAGS SEQ 0026

```
                                        ;;SET UP SOFTWARE SWITCH REGISTER
001344  012737  000176  000426  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
001352  012737  000174  000430          MOV     #DISPREG,DISPLAY

001360  005037  000636                  CLR     $PASS           ;;CLEAR PASS COUNT
001364  132737  000200  000651          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
001372  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
001374  012737  000652  000426          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
001402                          67$:


                                        ;DETERMINE OPERATING ENVIRONMENT
001402  005737  000042                  TST     @#42            ;ARE WE IN ACT/XXDP AUTO MODE?
001406  001410                          BEQ     1$              ;BRANCH IF NO
001410  023737  000042  000046          CMP     @#42,@#46       ;IS IT ACT AUTO MODE?
001416  001410                          BEQ     2$              ;BRANCH IF YES
001420  012737  177777  000464          MOV     #-1,XXDP        ;SET XXDP CHAIN MODE INDICATOR
001426  000404                          BR      2$              ;
001430  123727  000650  000001  1$:     CMPB    $ENV,#1         ;ARE WE IN APT AUTO MODE?
001436  001003                          BNE     3$              ;BRANCH IF NO
001440  112737  000001  000422  2$:     MOVB    #1,$AUTOB       ;SET AUTO MODE INDICATOR
                                        ;PRINT TITLE IF NOT IN ACT OR APT AUTO MODE
001446  005227  177777          3$:     INC     #-1             ;FIRST TIME?
001452  001012                          BNE     5$              ;SKIP TITLE IF NOT
001454  005737  000422                  TST     $AUTOB          ;ARE WE IN AUTO MODE?
001460  001403                          BEQ     4$              ;BRANCH TO TITLE TYPEOUT IF NOT
001462  005737  000464                  TST     XXDP            ;IS THE AUTO MODE UNDER XXDP?
001466  001404                          BEQ     5$              ;SKIP TITLE IF NOT
001470  012737  060434  000546  4$:     MOV     #TITLE,MSGADR
001476  104401                          TYPE                    ;PRINT OUT THE TITLE
                                        ;GET THE VALUE IN THE SOFTWARE SWITCH REGISTER
001500  005737  000422          5$:     TST     $AUTOB          ;ARE WE IN AN AUTOMATIC MODE?
001504  001001                          BNE     BEGIN           ;BRANCH IF YES
001506  104405                          GTSWR                   ;ASK FOR SWR INPUT FROM THE CONSOLE TERMINAL

001510                          BEGIN:
```

```
                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;++
                        ;               C I S 4     M O D U L E
                        ;
                        ;  THIS MODULE TESTS THE LOAD DESCRIPTOR INSTRUCTIONS AND THE CHARACTER
                        ;  INSTRUCTIONS:  L2DR, L3DR, MOVC, MOVRC, MOVTC, LOCC, SKPC, SCANC,
                        ;  SPANC, CMPC, AND MATC.
                        ;--
                        ;;*****************************************************************
                        ;;*****************************************************************



                        .SBTTL  CIS4 INITIALIZATION
                        ;;*****************************************************************
                        ;
                        ;  CIS4 INITIALIZATION
                        ;
                        ;;*****************************************************************

                        ;IF SWR<5:0> ARE CLEARED OR IF SWR<0> IS SET THEN EXECUTE
                        ;  THE CIS4 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

001510                  INLINE   <SCOPE>
001510  000004                                                          SCOPE

001512                  LET TEMP0 := @SWR CLR.BY #177700
001512  017737  176710  000474                                         MOV     @SWR,TEMP0
001520  042737  177700  000474                                         BIC     #177700,TEMP0
001526                  IF TEMP0 NE #0 THEN
001526  005737  000474                                                 TST     TEMP0
001532  001406                                                         BEQ     $50000
001534                      IF #BIT0 NOTSETIN TEMP0 THEN
001534  032737  000001  000474                                         BIT     #BIT0,TEMP0
001542  001002                                                         BNE     $50001
001544                          INLINE   <JMP   CIS4END>
001544  000137  015716                                                 JMP   CIS4END
001550                      ENDIF
001550                                                          $50001:
001550                  ENDIF
001550                                                          $50000:
001550
001550                  LET CTL :  #4           ;CONTROL CHIP NUMBER
001550  012737  000004  000544                                         MOV     #4,CTL
001556                  LET ERRFLG :  #0        ;INITIALIZE ERROR FLAG
001556  005037  000454                                                 CLR     ERRFLG
001562                  LET PSW :  #340
001562  012737  000340  177776                                         MOV     #340,PSW
```

```
                                .SBTTL  L2DR
                                ;;*****************************************************************
                                ;
                                ;       L2DR TEST
                                ; THIS TEST USES L2D0, L2D4, AND L2D7 TO TEST L2DR.
                                ;
                                ;;*****************************************************************

001570                          INLINE  <XL2DR:>
001570                                                                          XL2DR:
001570                            INLINE  <SCOPE>
001570  000004                                                                  SCOPE
001572                            LET $TIMES :  #20             ;ITERATION COUNT
001572  012737  000020  000404                                                 MOV     #20,$TIMES
001600                             ET COUNT := #2
001600  012737  000002  000466                                                 MOV     #2,COUNT
001606                            REPEAT
001606                                                                  $50002:
                                        ;+
                                        ; SET UP THE GPR'S AND DO
                                        ; THE CIS INSTRUCTION
                                        ;-

001606                                  CALL CLRREG             ;CLEAR R0-R5
001606  004737  055330                                                         JSR     PC,CLRREG
001612                                  IF COUNT EQ #2 THEN
001612  023727  000466  000002                                                 CMP     COUNT,#2
001620  001005                                                                 BNE     $50003
001622
                                     LET R0 := #ADR.A
001622  012700  002172                                                         MOV     #ADR.A,R0
001626                               INLINE  <CCC>
001626  000257                                                                 CCC
001630                               INLINE  <L2D0>
001630  076020                                                                 L2D0
001632                                  ELSE
001632  000404                                                                 BR      $50004
001634                                                                  $50003:
001634                               LET R4 := #ADR.A
001634  012704  002172                                                         MOV     #ADR.A,R4
001640                               INLINE  <SCC>
001640  000277                                                                 SCC
001642                               INLINE  <L2D4>
001642  076024                                                                 L2D4
001644                                  ENDIF
001644                                                                  $50004:
001644                                  LET CC := PSW
001644  013737  177776  000516                                                 MOV     PSW,CC
001652                                  LET CC := CC CLR.BY #177760
001652  042737  177760  000516                                                 BIC     #177760,CC
001660                                  LET ERR  := #1          ;CODE FOR INSTRUCTION FAILURE
001660  012737  000001  000550                                                 MOV     #1,ERR

                                        ;+
                                        ;  CHECK RESULTS AND REPORT ERRORS
                                        ;-
```

```
                                                IF COUNT EQ #2 THEN
001666  023727  000466  000002                                                CMP     COUNT,#2
001674  001006                                                                BNE     $50005
                                                    IF CC NE #0 THEN
001676  005737  000516                                                        TST     CC
001702  001402                                                                BEQ     $50006
                                                       CALL ERROR
001704  004737  056274                                                        JSR     PC,ERROR
                                                    ENDIF
001710                                                                  $50006:
                                                ELSE
001710  000406                                                                BR      $50007
001712                                                                  $50005:
                                                    IF CC NE #17 THEN
001712  023727  000516  000017                                                CMP     CC,#17
001720  001402                                                                BEQ     $50010
                                                       CALL ERROR
001722  004737  056274                                                        JSR     PC,ERROR
                                                    ENDIF
001726                                                                  $50010:
                                                ENDIF
001726                                                                  $50007:
                                                IF R0 NE ALPHA THEN
001726  020037  002200                                                        CMP     R0,ALPHA
001732  001402                                                                BEQ     $50011
                                                   CALL ERROR
001734  004737  056274                                                        JSR     PC,ERROR
                                                ENDIF
001740                                                                  $50011:
                                                IF R1 NE ALPHA+2 THEN
001740  020137  002202                                                        CMP     R1,ALPHA+2
001744  001402                                                                BEQ     $50012
                                                   CALL ERROR
001746  004737  056274                                                        JSR     PC,ERROR
                                                ENDIF
001752                                                                  $50012:
                                                IF R2 NE BETA THEN
001752  020237  002204                                                        CMP     R2,BETA
001756  001402                                                                BEQ     $50013
                                                   CALL ERROR
001760  004737  056274                                                        JSR     PC,ERROR
                                                ENDIF
001764                                                                  $50013:
                                                IF R3 NE BETA+2 THEN
001764  020337  002206                                                        CMP     R3,BETA+2
001770  001402                                                                BEQ     $50014
                                                   CALL ERROR
001772  004737  056274                                                        JSR     PC,ERROR
                                                ENDIF
001776                                                                  $50014:
                                                IF R5 NE #0 THEN
001776  005705                                                                TST     R5
002000  001402                                                                BEQ     $50015
                                                   CALL ERROR
002002  004737  056274                                                        JSR     PC,ERROR
```

```
647  002006                                  ENDIF
648  002006
649  002006                                  IF COUNT EQ #2 THEN
650  002006  023727  000466  000002                                      $50015:
651  002014  001005                                                         CMP     COUNT,#2
652  002016                                     IF R4 NE #0 THEN             BNE     $50016
653  002016  005704                                                         TST     R4
654  002020  001402                                                         BEQ     $50017
655  002022                                        CALL ERROR
656  002022  004737  056274                                                JSR     PC,ERROR
657  002026                                     ENDIF                     $50017:
658  002026
659  002026                                  ELSE                            BR      $50020
660  002026  000405                                                      $50016:
661  002030
662  002030                                     IF R4 NE #ADR.A+4 THEN       CMP     R4,#ADR.A+4
663  002030  020427  002176                                                 BEQ     $50021
664  002034  001402
665  002036                                        CALL ERROR                JSR     PC,ERROR
666  002036  004737  056274
667  002042                                     ENDIF                     $50021:
668  002042
669  002042                                  ENDIF                        $50020:
670  002042
671  002042                                  LET COUNT := COUNT - #1           DEC     COUNT
672  002042  005337  000466
673  002046                               UNTIL COUNT EQ #0                   TST     COUNT
674  002046  005737  000466                                                 BNE     $50002
675  002052  001255
676
677                                       ;+
678                                       ; TEST THE SPECIAL CASE OF USING R7
679                                       ;-
680
681  002054                               LET R4 := #0
682  002054  005004                                                      CLR     R4
683  002056                               LET R5 :- #0
684  002056  005005                                                      CLR     R5
685  002060                               INLINE  <L2D7>
686  002060  076027                                                     L2D7
687  002062                               INLINE  <.WORD  240>          ;NOP
688  002062  000240                                                     .WORD   240
689  002064                               INLINE  <.WORD  402>          ;BR TO ERROR CALL
690  002064  000402                                                     .WORD   402
691  002066                               INLINE  <.WORD  403>          ;BR OVER ERROR CALL
692  002066  000403                                                     .WORD   403
693  002070                               INLINE  <.WORD  240>          ;NOP
694  002070  000240                                                     .WORD   240
695  002072                               CALL ERROR
696  002072  004737  056274                                            JSR     PC,ERROR
697  002076                               IF R0 NE @#240 THEN
698  002076  020037  000240                                             CMP     R0,@#240
699  002102  001402                                                     BEQ     $50022
700  002104                                     CALL ERROR
701  002104  004737  056274                                            JSR     PC,ERROR
702  002110                               ENDIF
```

```
                                                                    $50022:
                        IF R1 NE @#242 THEN                                     CMP     R1,@#242
                                                                                BEQ     $50023
                                CALL ERROR                                      JSR     PC,ERROR
                        ENDIF
                                                                    $50023:
                        IF R2 NE @#402 THEN                                     CMP     R2,@#402
                                                                                BEQ     $50024
                                CALL ERROR                                      JSR     PC,ERROR
                        ENDIF
                                                                    $50024:
                        IF R3 NE @#404 THEN                                     CMP     R3,@#404
                                                                                BEQ     $50025
                                CALL ERROR                                      JSR     PC,ERROR
                        ENDIF
                                                                    $50025:
                        IF R4 NE #0 THEN                                        TST     R4
                                                                                BEQ     $50026
                                CALL ERROR                                      JSR     PC,ERROR
                        ENDIF
                                                                    $50026:
                        IF R5 NE #0 THEN                                        TST     R5
                                                                                BEQ     $50027
                                CALL ERROR                                      JSR     PC,ERROR
                        ENDIF
                                                                    $50027:
                        INLINE  <JMP    XL3DR>                                  JMP     XL3DR

                        ;+
                        ; TEST TABLE FOR L2DR AND L3DR
                        ;-

002172  002200  ADR.A:  .WORD   ALPHA
002174  002204         .WORD   BETA
002176  002210         .WORD   GAMMA
002200  177777  ALPHA:  .WORD    177777          ;ALPHA.LEN
002202  052525         .WORD    052525          ;ALPHA.ADR
002204  125252  BETA:   .WORD    125252          ;BETA.LEN
002206  177777         .WORD    177777          ;BETA.ADR
002210  107070  GAMMA:  .WORD    107070          ;GAMMA.LEN
002212  070707         .WORD    070707          ;GAMMA.ADR
```

```
                                        .SBTTL  L3DR
                                        ;;*****************************************************************
                                        ;
                                        ;       L3DR TEST
                                        ; THIS TEST USES L3D3, L3D5, AND L3D7 TO TEST L3DR.
                                        ;
                                        ;;*****************************************************************

002214                                  INLINE  <XL3DR:>
002214                                                                                  XL3DR:
002214                                    INLINE  <SCOPE>
002214  000004                                                                         SCOPE
002216                                    LET $TIMES :- #20             ;ITERATION COUNT
002216  012737  000020  000404                                                        MOV     #20,$TIMES
002224                                    LET COUNT :  #2
002224  012737  000002  000466                                                        MOV     #2,COUNT
002232                                    REPEAT
002232                                                                          $50030:

                                          ;+
                                          ; SET UP THE GPR'S AND DO
                                          ; THE CIS INSTRUCTION
                                          ;-

002232                                    CALL CLRREG
002232  004737  055330                                                              JSR     PC,CLRREG
002236                                    IF COUNT EQ #2 THEN
002236  023727  000466  000002                                                      CMP     COUNT,#2
002244  001005                                                                      BNE     $50031
002246
002246  012703  002172                      LET R3 :- #ADR.A                      MOV     #ADR.A,R3
002252
002252  000257                            INLINE  <CCC>                           CCC
002254
002254  076063                            INLINE  <L3D3>                          L3D3
002256
002256  000404                          ELSE                                      BR      $50032
002260                                                                          $50031:
002260
002260  012705  002172                      LET R5 := #ADR.A                      MOV     #ADR.A,R5
002264
002264  000277                            INLINE  <SCC>                           SCC
002266
002266  076065                            INLINE  <L3D5>                          L3D5
002270                                  ENDIF
002270                                                                          $50032:
002270
002270  013737  177776  000516        LET CC := PSW                             MOV     PSW,CC
002276
002276  042737  177760  000516        LET CC := CC CLR.BY #177760               BIC     #177760,CC
002304
002304  012737  000001  000550        LET ERR := #1           ;CODE FOR INSTRUCTION FAILURE
                                                                                  MOV     #1,ERR

                                        ;+
                                        ; CHECK RESULTS AND REPORT ERRORS
                                        ;-
```

```
811
812  002312                                  IF COUNT EQ #2 THEN
813  002312  023727  000466  000002                                    CMP     COUNT,#2
814  002320  001006                                                   BNE     $50033
815  002322
816  002322  005737  000516                     IF CC NE #0 THEN      TST     CC
817  002326  001402                                                   BEQ     $50034
818  002330
819  002330  004737  056274                        CALL ERROR         JSR     PC,ERROR
820  002334                                     ENDIF
821  002334                                                       $50034:
822  002334                                  ELSE
823  002334  000406                                                   BR      $50035
824  002336                                                       $50033:
825  002336
826  002336  023727  000516  000017               IF CC NE #17 THEN     CMP     CC,#17
827  002344  001402                                                   BEQ     $50036
828  002346
829  002346  004737  056274                        CALL ERROR         JSR     PC,ERROR
830  002352                                     ENDIF
831  002352                                                       $50036:
832  002352                                  ENDIF
833  002352                                                       $50035:
834  002352
835  002352  020037  002200                  IF R0 NE ALPHA THEN      CMP     R0,ALPHA
836  002356  001402                                                   BEQ     $50037
837  002360
838  002360  004737  056274                     CALL ERROR            JSR     PC,ERROR
839  002364                                  ENDIF
840  002364                                                       $50037:
841  002364
842  002364  020137  002202                  IF R1 NE ALPHA+2 THEN    CMP     R1,ALPHA+2
843  002370  001402                                                   BEQ     $50040
844  002372
845  002372  004737  056274                     CALL ERROR            JSR     PC,ERROR
846  002376                                  ENDIF
847  002376                                                       $50040:
848  002376
849  002376  020237  002204                  IF R2 NE BETA THEN       CMP     R2,BETA
850  002402  001402                                                   BEQ     $50041
851  002404
852  002404  004737  056274                     CALL ERROR            JSR     PC,ERROR
853  002410                                  ENDIF
854  002410                                                       $50041:
855  002410
856  002410  020337  002206                  IF R3 NE BETA+2 THEN     CMP     R3,BETA+2
857  002414  001402                                                   BEQ     $50042
858  002416
859  002416  004737  056274                     CALL ERROR            JSR     PC,ERROR
860  002422                                  ENDIF
861  002422                                                       $50042:
862  002422
863  002422  020437  002210                  IF R4 NE GAMMA THEN      CMP     R4,GAMMA
864  002426  001402                                                   BEQ     $50043
865  002430
866  002430  004737  056274                     CALL ERROR            JSR     PC,ERROR
```

```
867  002434                                  ENDIF
868  002434
869  002434                                  IF R5 NE GAMMA+2 THEN
870  002434  020537  002212                                                  $50043:
871  002440  001402                                                                  CMP     R5,GAMMA+2
872  002442                                                                          BEQ     $50044
873  002442  004737  056274                     CALL ERROR                           JSR     PC,ERROR
874  002446                                  ENDIF
875  002446                                                                  $50044:
876  002446                                  LET COUNT := COUNT - #1                 DEC     COUNT
877  002446  005337  000466                                                          TST     COUNT
878  002452                                  UNTIL COUNT EQ #0                       BNE     $50030
879  002452  005737  000466
880  002456  001265
881
882                                          ;+
883                                          ; TEST THE SPECIAL CASE OF USING R7
884                                          ;-
885
886  002460                                  INLINE  <L3D7>                          L3D7
887  002460  076067
888  002462                                  INLINE  <.WORD  240>    ;NOP           .WORD   240
889  002462  000240
890  002464                                  INLINE  <.WORD  240>    ;NOP           .WORD   240
891  002464  000240
892  002466                                  INLINE  <.WORD  402>    ;BR TO ERROR CALL  .WORD   402
893  002466  000402
894  002470                                  INLINE  <.WORD  403>    ;BR OVER ERROR CALL  .WORD   403
895  002470  000403
896  002472                                  INLINE  <.WORD  240>    ;NOP           .WORD   240
897  002472  000240
898  002474                                  CALL ERROR                             JSR     PC,ERROR
899  002474  004737  056274
900  002500                                  IF R0 NE @#240 THEN                    CMP     R0,@#240
901  002500  020037  000240                                                         BEQ     $50045
902  002504  001402
903  002506                                          CALL ERROR                     JSR     PC,ERROR
904  002506  004737  056274
905  002512                                  ENDIF                          $50045:
906  002512
907  002512                                  IF R1 NE @#242 THEN                    CMP     R1,@#242
908  002512  020137  000242                                                         BEQ     $50046
909  002516  001402
910  002520                                          CALL ERROR                     JSR     PC,ERROR
911  002520  004737  056274
912  002524                                  ENDIF                          $50046:
913  002524
914  002524                                  IF R2 NE @#240 THEN                    CMP     R2,@#240
915  002524  020237  000240                                                         BEQ     $50047
916  002530  001402
917  002532                                          CALL ERROR                     JSR     PC,ERROR
918  002532  004737  056274
919  002536                                  ENDIF                          $50047:
920  002536
921  002536                                  IF R3 NE @#242 THEN                    CMP     R3,@#242
922  002536  020337  000242
```

```
  923  002542  001402                        BEQ     $50050
  924  002544                        CALL ERROR
  925  002544  004737  056274                JSR     PC,ERROR
  926  002550                        ENDIF
  927  002550                                $50050:
  928  002550                        IF R3 NE @#242 THEN
  929  002550  020337  000242                CMP     R3,@#242
  930  002554  001402                        BEQ     $50051
  931  002556                        CALL ERROR
  932  002556  004737  056274                JSR     PC,ERROR
  933  002562                        ENDIF
  934  002562                                $50051:
  935  002562                        IF R4 NE @#402 THEN
  936  002562  020437  000402                CMP     R4,@#402
  937  002566  001402                        BEQ     $50052
  938  002570                        CALL ERROR
  939  002570  004737  056274                JSR     PC,ERROR
  940  002574                        ENDIF
  941  002574                                $50052:
  942  002574                        IF R5 NE @#404 THEN
  943  002574  020537  000404                CMP     R5,@#404
  944  002600  001402                        BEQ     $50053
  945  002602                        CALL ERROR
  946  002602  004737  056274                JSR     PC,ERROR
  947  002606                        ENDIF
  948  002606                                $50053:
  949  002606                        INLINE  <JMP    XMOVC>
  950  002606  000137  002612                JMP     XMOVC
```

```
                                        .SBTTL  MOVC
                                        ;;*****************************************************************
                                        ;
                                        ;  MOVC TEST
                                        ;
                                        ;;*****************************************************************

002612                                  INLINE  <XMOVC:>
002612                                                                                  XMOVC:
002612                                  INLINE  <SCOPE>
002612  000004                                                                        SCOPE
002614                                  LET $TIMES := #20               ;ITERATION COUNT
002614  012737  000020  000404                                                       MOV     #20,$TIMES
002622                                  LET COUNT := TMOVC              ;GET TEST COUNT
002622  013737  004134  000466                                                       MOV     TMOVC,COUNT
002630                                  LET TSTCAS := #TMOVC+2          ;POINT TO FIRST TEST CASE
002630  012737  004136  000542                                                       MOV     #TMOVC+2,TSTCAS
                                        ;REPEAT
002636                                  INLINE  <$5030:>
002636                                                                                  $5030:

                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-

002636                                          LET R0 := TSTCAS
002636  013700  000542                                                               MOV     TSTCAS,R0
002642                                          LET DATA00 := (R0)+             ;SRC.LEN
002642  012037  000560                                                               MOV     (R0)+,DATA00
002646                                          LET DATA01 := (R0)+             ;SRC.ADR
002646  012037  000562                                                               MOV     (R0)+,DATA01
002652                                          LET DATA02 := (R0)+             ;DST.LEN
002652  012037  000564                                                               MOV     (R0)+,DATA02
002656                                          LET DATA03 := (R0)+             ;DST.ADR
002656  012037  000566                                                               MOV     (R0)+,DATA03
002662                                          LET DATA04 := (R0)+             ;FILL CHAR.
002662  012037  000570                                                               MOV     (R0)+,DATA04
002666                                          LET DATA05 := (R0)+             ;SRC.BUFF.STATE
002666  012037  000572                                                               MOV     (R0)+,DATA05
002672                                          LET DATA06 := (R0)              ;DST.BUFF.STATE
002672  011037  000574                                                               MOV     (R0),DATA06

                                        ;+
                                        ;  SET UP THE GPR'S
                                        ;  EXPECTED GPR'S AND CONDITION CODES,
                                        ;  AND BUFFERS.
                                        ;-

002676                                  LET R0 := DATA00
002676  013700  000560                                                               MOV     DATA00,R0
002702                                  LET R1 := DATA01
002702  013701  000562                                                               MOV     DATA01,R1
002706                                  LET R2 := DATA02
002706  013702  000564                                                               MOV     DATA02,R2
002712                                  LET R3 := DATA03
002712  013703  000566                                                               MOV     DATA03,R3
```

```
1007  002716                                  LET R4 := DATA04                                    MOV     DATA04,R4
1008  002716  013704  000570
1009  002722                                  IF #1 SETIN COUNT THEN                              BIT     #1,COUNT
1010  002722  032737  000001  000466                                                              BEQ     $50054
1011  002730  001403
1012  002732                                     LET R5 := #177777                                MOV     #177777,R5
1013  002732  012705  177777
1014  002736                                  ELSE                                                BR      $50055
1015  002736  000401
1016  002740                                                                                   $50054:
1017  002740                                     LET R5 := #0
1018  002740  005005                                                                          CLR     R5
1019  002742                                  ENDIF
1020  002742                                                                                   $50055:
1021  002742
1022  002742  020002                          INLINE  <CMP    R0,R2>                           CMP     R0,R2
1023  002744
1024  002744  013737  177776  000520          LET CC.EXP := PSW                                MOV     PSW,CC.EXP
1025  002752
1026  002752  042737  177760  000520          LET CC.EXP := CC.EXP CLR.BY #177760              BIC     #177760,CC.EXP
1027  002760
1028  002760  032737  000001  000520          IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN BIT     #CBIT,CC.EXP
1029  002766  001004                                                                           BNE     $50056
1030  002770  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
1031  002776  001403                                                                          BEQ     $50057
1032  003000                                                                                   $50056:
1033  003000
1034  003000  005037  000522                     LET R0.EXP := #0                              CLR     R0.EXP
1035  003004
1036  003004  000404                          ELSE                                                BR      $50060
1037  003006                                                                                   $50057:
1038  003006
1039  003006  010037  000522                     LET R0.EXP := R0 - R2                     ;SRC.LEN - DST.LEN
1040  003012  160237  000522                                                                  MOV     R0,R0.EXP
1041  003016                                                                                   SUB     R2,R0.EXP
1042  003016                                  ENDIF                                               $50060:
1043  003016
1044  003016  005037  000524                  LET R1.EXP := #0                                 CLR     R1.EXP
1045  003022
1046  003022  005037  000526                  LET R2.EXP := #0                                 CLR     R2.EXP
1047  003026
1048  003026  005037  000530                  LET R3.EXP := #0                                 CLR     R3.EXP
1049  003032
1050  003032  010437  000532                  LET R4.EXP := R4                                 MOV     R4,R4.EXP
1051  003036
1052  003036  010537  000534                  LET R5.EXP := R5                                 MOV     R5,R5.EXP
1053  003042
1054  003042  010137  000540                  LET BFADRS := R1                           ;SRC.ADR
1055  003046                                                                                   MOV     R1,BFADRS
1056  003046  005737  000572                  IF DATA05 EQ #0 THEN                             TST     DATA05
1057  003052  001003                                                                          BNE     $50061
1058  003054
1059  003054  004737  055346                     CALL CLRBUF                                   JSR     PC,CLRBUF
1060  003060
1061  003060  000411                          ELSE                                                BR      $50062
1062  003062                                                                                   $50061:
```

```
1063  003062                                  IF DATA05 EQ #177777 THEN
1064  003062  023727  000572  177777                                          CMP     DATA05,#177777
1065  003070  001003                                                          BNE     $50063
1066  003072
1067  003072  004737  055410                     CALL SETBUF                  JSR     PC,SETBUF
1068  003076                                  ELSE
1069  003076  000402                                                          BR      $50064
1070  003100                                                          $50063:
1071  003100
1072  003100  004737  055454                     CALL ALTBUF                  JSR     PC,ALTBUF
1073  003104                                  ENDIF
1074  003104                                                          $50064:
1075  003104                              ENDIF
1076  003104                                                          $50062:
1077  003104
1078  003104  010337  000540              LET BFADRS := R3             ;DST.ADR
1079  003110                              IF DATA06 EQ #0 THEN
1080  003110  005737  000574                                          MOV     R3,BFADRS
1081  003114  001003                                                  TST     DATA06
1082  003116                                                          BNE     $50065
1083  003116  004737  055346                     CALL CLRBUF                  JSR     PC,CLRBUF
1084  003122                                  ELSE
1085  003122  000411                                                          BR      $50066
1086  003124                                                          $50065:
1087  003124                                  IF DATA06 EQ #177777 THEN
1088  003124  023727  000574  177777                                          CMP     DATA06,#177777
1089  003132  001003                                                          BNE     $50067
1090  003134
1091  003134  004737  055410                     CALL SETBUF                  JSR     PC,SETBUF
1092  003140                                  ELSE
1093  003140  000402                                                          BR      $50070
1094  003142                                                          $50067:
1095  003142
1096  003142  004737  055454                     CALL ALTBUF                  JSR     PC,ALTBUF
1097  003146                                  ENDIF
1098  003146                                                          $50070:
1099  003146                              ENDIF
1100  003146                                                          $50066:
1101  003146
1102  003146  005737  000564              IF DATA02 EQ #0 THEN                TST     DATA02
1103  003152  001003                                                          BNE     $50071
1104  003154
1105  003154  011337  000536                  LET BF.EXP := (R3)              MOV     (R3),BF.EXP
1106  003160                              ELSE
1107  003160  000402                                                          BR      $50072
1108  003162                                                          $50071:
1109  003162
1110  003162  011137  000536                  LET BF.EXP := (R1)              MOV     (R1),BF.EXP
1111  003166                              ENDIF
1112  003166                                                          $50072:
1113
1114                                      ;+
1115                                      ; DO THE CIS INSTRUCTION
1116                                      ;-
1117
1118  003166                              INLINE  <MOVC>
```

```
1119  003166  076030                                                          MOVC
1120
1121                                    ;+
1122                                    ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
1123                                    ;-
1124
1125  003170                            LET CC := PSW
1126  003170  013737  177776  000516                                          MOV     PSW,CC
1127  003176                            LET CC := CC CLR.BY #177760
1128  003176  042737  177760  000516                                          BIC     #177760,CC
1129  003204                            IF CC NE CC.EXP THEN
1130  003204  023737  000516  000520                                          CMP     CC,CC.EXP
1131  003212  001402                                                         BEQ     $50073
1132  003214                                CALL ERROR
1133  003214  004737  056274                                                 JSR     PC,ERROR
1134  003220                            ENDIF
1135  003220                                                          $50073:
1136  003220                            IF R0 NE R0.EXP THEN
1137  003220  020037  000522                                                 CMP     R0,R0.EXP
1138  003224  001402                                                         BEQ     $50074
1139  003226                                CALL ERROR
1140  003226  004737  056274                                                 JSR     PC,ERROR
1141  003232                            ENDIF
1142  003232                                                          $50074:
1143  003232                            IF R1 NE R1.EXP THEN
1144  003232  020137  000524                                                 CMP     R1,R1.EXP
1145  003236  001402                                                         BEQ     $50075
1146  003240                                CALL ERROR
1147  003240  004737  056274                                                 JSR     PC,ERROR
1148  003244                            ENDIF
1149  003244                                                          $50075:
1150  003244                            IF R2 NE R2.EXP THEN
1151  003244  020237  000526                                                 CMP     R2,R2.EXP
1152  003250  001402                                                         BEQ     $50076
1153  003252                                CALL ERROR
1154  003252  004737  056274                                                 JSR     PC,ERROR
1155  003256                            ENDIF
1156  003256                                                          $50076:
1157  003256                            IF R3 NE R3.EXP THEN
1158  003256  020337  000530                                                 CMP     R3,R3.EXP
1159  003262  001402                                                         BEQ     $50077
1160  003264                                CALL ERROR
1161  003264  004737  056274                                                 JSR     PC,ERROR
1162  003270                            ENDIF
1163  003270                                                          $50077:
1164  003270                            IF R4 NE R4.EXP THEN
1165  003270  020437  000532                                                 CMP     R4,R4.EXP
1166  003274  001402                                                         BEQ     $50100
1167  003276                                CALL ERROR
1168  003276  004737  056274                                                 JSR     PC,ERROR
1169  003302                            ENDIF
1170  003302                                                          $50100:
1171  003302                            IF R5 NE R5.EXP THEN
1172  003302  020537  000534                                                 CMP     R5,R5.EXP
1173  003306  001402                                                         BEQ     $50101
1174  003310                                CALL ERROR
```

```
1175  003310  004737  056274                                                    JSR     PC,ERROR
1176  003314                          ENDIF
1177  003314                                                                $50101:
1178
1179                                  ;+
1180                                  ; CHECK ENTIRE DES" VATION BUFFER FOR CORRECT RESULTS
1181                                  ;-
1182
1183  003314                          LET R0 := DATA01                ;SRC.ADR
1184  003314  013700  000562                                                   MOV     DATA01,R0
1185  003320                          LET R1 := DATA03                ;DST.ADR
1186  003320  013701  000566                                                   MOV     DATA03,R1
1187  003324                          LET ERRFLG := #0
1188  003324  005037  000454                                                   CLR     ERRFLG
1189  003330                          IF DATA00 HIS DATA02    THEN
1190  003330  023737  000560  000564                                           CMP     DATA00,DATA02
1191  003336  103417                                                           BLO     $50102
1192  003340
1193  003340  013703  000564            LET R3 := DATA02                      MOV     DATA02,R3
1194  003344                            WHILE R3 NE #0 AND ERRFLG EQ #0 DO
1195  003344                                                                $50103:
1196  003344  005703                                                           TST     R3
1197  003346  001412                                                           BEQ     $50104
1198  003350  005737  000454                                                   TST     ERRFLG
1199  003354  001007                                                           BNE     $50104
1200  003356
1201  003356  123721  000536              IFB BF.EXP NE (R1)+ THEN             CMPB    BF.EXP,(R1)+
1202  003362  001402                                                           BEQ     $50105
1203  003364
1204  003364  004737  056274                  CALL ERROR                       JSR     PC,ERROR
1205  003370                              ENDIF
1206  003370                                                                $50105:
1207  003370
1208  003370  005303                      LET R3 := R3 - #1                    DEC     R3
1209  003372
1210  003372  000764                    ENDDO                                  BR      $50103
1211  003374                                                                $50104:
1212  003374
1213  003374  000441                  ELSE                                     BR      $50106
1214  003376                                                                $50102:
1215  003376
1216  003376  013703  000560            LET R3 := DATA00                ;SRC.LEN
1217  003402                                                                    MOV     DATA00,R3
1218  003402                            WHILE R3 NE #0 AND ERRFLG EQ #0 DO
1219  003402  005703                                                        $50107:
1220  003404  001412                                                           TST     R3
1221  003406  005737  000454                                                   BEQ     $50110
1222  003412  001007                                                           TST     ERRFLG
1223  003414                                                                   BNE     $50110
1224  003414  123721  000536              IFB BF.EXP NE (R1)+ THEN
1225  003420  001402                                                           CMPB    BF.EXP,(R1)+
1226  003422                                                                   BEQ     $50111
1227  003422  004737  056274                  CALL ERROR                       JSR     PC,ERROR
1228  003426                              ENDIF
1229  003426                                                                $50111:
1230  003426                              LET R3 := R3 - #1
```

```
1231  003426  005303                          ENDDO                                   DEC     R3
1232  003430                                                                          BR      $50107
1233  003430  000764                                                               $50110:
1234  003432                                  LET R3 := DATA02  -  DATA00
1235  003432                                                                          MOV     DATA02,R3
1236  003432  013703  000564                                                        SUB     DATA00,R3
1237  003436  163703  000560
1238  003442                                  LET R1 := DATA03  +  DATA00
1239  003442  013701  000566                                                        MOV     DATA03,R1
1240  003446  063701  000560                                                        ADD     DATA00,R1
1241  003452
1242  003452                                  REPEAT                                $50112:
1243  003452
1244  003452  122137  000570                     IFB (R1)+ NE DATA04 THEN            CMPB    (R1)+,DATA04
1245  003456  001402                                                                BEQ     $50113
1246  003460                                        CALL ERROR
1247  003460  004737  056274                                                        JSR     PC,ERROR
1248  003464                                     ENDIF
1249  003464                                                                     $50113:
1250  003464                                     LET R3 := R3 - #1
1251  003464  005303                                                                 DEC     R3
1252  003466                                  UNTIL R3 EQ #0 OR ERRFLG NE #0
1253  003466  005703                                                                 TST     R3
1254  003470  001403                                                                BEQ     $50114
1255  003472  005737  000454                                                        TST     ERRFLG
1256  003476  001765                                                                BEQ     $50112
1257  003500                                                                     $50114:
1258  003500                             ENDIF
1259  003500                                                                     $50106:
1260  003500                             LET ERRFLG := #0
1261  003500  005037  000454                                                        CLR     ERRFLG
1262  003504
1263  003504  023727  000564  000100     IF DATA02 LO #BUFLEN THEN                CMP     DATA02,#BUFLEN
1264  003512  103040                                                                BHIS    $50115
1265  003514
1266  003514  023727  000574  000001         IF DATA06 EQ #1 THEN                 CMP     DATA06,#1
1267  003522  001004                                                                BNE     $50116
1268  003524
1269  003524  012737  125252  000536             LET BF.EXP := #125252             MOV     #125252,BF.EXP
1270  003532
1271  003532  000403                         ELSE                                   BR      $50117
1272  003534                                                                     $50116:
1273  003534
1274  003534  013737  000574  000536             LET BF.EXP :- DATA06              MOV     DATA06,BF.EXP
1275  003542                                 ENDIF                               $50117:
1276  003542
1277  003542                                 LET R0 := DATA02 + DATA03
1278  003542  013700  000564                                                        MOV     DATA02,R0
1279  003546  063700  000566                                                        ADD     DATA03,R0
1280  003552
1281  003552  013737  000566  000474     LET TEMP0 := DATA03 + #BUFLEN            MOV     DATA03,TEMP0
1282  003560  062737  000100  000474                                                ADD     #BUFLEN,TEMP0
1283  003566
1284  003566                                 REPEAT                              $50120:
1285  003566
1286  003566  122037  000536                  IFB (R0)+ NE BF.EXP THEN              CMPB    (R0)+,BF.EXP
```

```
1287  003572  001402                                                                    BEQ     $50121
1288  003574
1289  003574  004737  056274                                                          JSR     PC,ERROR
1290  003600
1291  003600                                                                      $50121:
1292  003600
1293  003600  020037  000474                                                          CMP     R0,TEMPO
1294  003604  001403                                                                  BEQ     $50122
1295  003606  005737  000454                                                          TST     ERRFLG
1296  003612  001765                                                                  BEQ     $50120
1297  003614                                                                      $50122:
1298  003614
1299  003614                                                                      $50115:
1300  003614
1301  003614  062737  000016  000542                                                  ADD     #16,TSTCAS
1302  003622
1303  003622  005337  000466                                                          DEC     COUNT
1304
1305  003626
1306  003626  005737  000466                                                          TST     COUNT
1307  003632  001402                                                                  BEQ     $50123
1308  003634
1309  003634  000137  002636                                                          JMP     $5030
1310  003640
1311  003640                                                                      $50123:
1312
1313
1314
1315
1316
1317
1318  003640
1319  003640  012737  061166  000540                                                  MOV     #BUFF1,BFADRS
1320  003646
1321  003646  004737  055410                                                          JSR     PC,SETBUF
1322  003652
1323  003652  012737  061266  000540                                                  MOV     #BUFF2,BFADRS
1324  003660
1325  003660  004737  055346                                                          JSR     PC,CLRBUF
1326  003664
1327  003664  012700  125252                                                          MOV     #125252,R0
1328  003670
1329  003670  012701  125252                                                          MOV     #125252,R1
1330  003674
1331  003674  012702  125252                                                          MOV     #125252,R2
1332  003700
1333  003700  012703  125252                                                          MOV     #125252,R3
1334  003704
1335  003704  012704  125252                                                          MOV     #125252,R4
1336  003710
1337  003710  012705  125252                                                          MOV     #125252,R5
1338  003714
1339  003714  005037  000454                                                          CLR     ERRFLG
1340  003720
1341  003720  076130                                                                  MOVCI
1342  003722
```

```
                        CALL ERROR
                      ENDIF
                    UNTIL R0 EQ TEMPO OR ERRFLG NE #0


                  ENDIF

                  LET TSTCAS := TSTCAS + #16
                  LET COUNT := COUNT - #1
;UNTIL COUNT EQ #0
IF COUNT NE #0 THEN

    INLINE  <JMP        $5030>

ENDIF


;+
; DO ONE IN-LINE CASE - MOVCI
;-

LET BFADRS := #BUFF1
CALL SETBUF
LET BFADRS := #BUFF2
CALL CLRBUF
LET R0 := #125252
LET R1 := #125252
LET R2 := #125252
LET R3 := #125252
LET R4 := #125252
LET R5 := #125252
LET ERRFLG := #0
INLINE  <MOVCI>
INLINE  <.WORD  TMOVCI>                 ;SRC.DSCR.PTR
```

```
1343  003722  004460                    INLINE  <.WORD  TMOVCI+4>                ;DST.DSCR.PTR                .WORD   TMOVCI
1344  003724                            INLINE  <.WORD  40>                      ;FILL CHARACTER              .WORD   TMOVCI+4
1345  003724  004464                    IFCOND CS THEN                                                        .WORD   40
1346  003726                               IFCOND EQ THEN                                                     BCC     $50124
1347  003726  000040                           CALL ERROR                                                     BNE     $50125
1348  003730                               ENDIF                                                              JSR     PC,ERROR
1349  003730  103003                    ENDIF                                                        $50125:
1350  003732                            IF R0 NE #125252 THEN                                        $50124:
1351  003732  001002                          CALL ERROR                                                     CMP     R0,#125252
1352  003734                            ENDIF                                                              BEQ     $50126
1353  003734  004737  056274           IF R1 NE #125252 THEN                                              JSR     PC,ERROR
1354  003740                                  CALL ERROR                                             $50126:
1355  003740                            ENDIF                                                              CMP     R1,#125252
1356  003740                            IF R2 NE #125252 THEN                                              BEQ     $50127
1357  003740                                  CALL ERROR                                                   JSR     PC,ERROR
1358  003740                            ENDIF                                                      $50127:
1359  003740  020027  125252           IF R3 NE #125252 THEN                                              CMP     R2,#125252
1360  003744  001402                         CALL ERROR                                                   BEQ     $50130
1361  003746                            ENDIF                                                              JSR     PC,ERROR
1362  003746  004737  056274           IF R4 NE #125252 THEN                                      $50130:
1363  003752                                  CALL ERROR                                                   CMP     R3,#125252
1364  003752                            ENDIF                                                              BEQ     $50131
1365  003752                            IF R5 NE #125252 THEN                                              JSR     PC,ERROR
1366  003752  020127  125252                 CALL ERROR                                             $50131:
1367  003756  001402                   ENDIF                                                              CMP     R4,#125252
1368  003760                                                                                               BEQ     $50132
1369  003760  004737  056274                                                                              JSR     PC,ERROR
1370  003764                                                                                       $50132:
1371  003764                                                                                             CMP     R5,#125252
1372  003764                                                                                             BEQ     $50133
1373  003764  020227  125252                                                                              JSR     PC,ERROR
1374  003770  001402
1375  003772
1376  003772  004737  056274
1377  003776
1378  003776
1379  003776
1380  003776  020327  125252
1381  004002  001402
1382  004004
1383  004004  004737  056274
1384  004010
1385  004010
1386  004010
1387  004010  020427  125252
1388  004014  001402
1389  004016
1390  004016  004737  056274
1391  004022
1392  004022
1393  004022
1394  004022  020527  125252
1395  004026  001402
1396  004030
1397  004030  004737  056274
1398  004034
```

```
 1399  004034                                  IF BUFF2 NE #177777 THEN
 1400  004034
 1401  004034  023727  061266  177777
 1402  004042  001402
 1403  004044                                     CALL ERROR
 1404  004044  004737  056274
 1405  004050                                  ENDIF
 1406  004050
 1407  004050                                  IF BUFF2+2 NE #20040 THEN
 1408  004050  023727  061270  020040
 1409  004056  001402
 1410  004060                                     CALL ERROR
 1411  004060  004737  056274
 1412  004064                                  ENDIF
 1413  004064
 1414  004064                                  LET R0 := #BUFF2+4
 1415  004064  012700  061272
 1416  004070                                  LET TEMP0 := #BUFF2 + #BUFLEN-2
 1417  004070  012737  061266  000474
 1418  004076  062737  000076  000474
 1419  004104                                  REPEAT
 1420  004104
 1421  004104                                    IF (R0)+ NE #0 THEN
 1422  004104  005720
 1423  004106  001402
 1424  004110                                       CALL ERROR
 1425  004110  004737  056274
 1426  004114                                    ENDIF
 1427  004114
 1428  004114                                  UNTIL R0 EQ TEMP0 OR ERRFLG NE #)
 1429  004114  020037  000474
 1430  004120  001403
 1431  004122  005737  000454
 1432  004126  001766
 1433  004130
 1434  004130                                  INLINE  <JMP    XMOVRC>
 1435  004130  000137  004470
 1436
 1437                                          ;+
 1438                                          ; TABLE OF TEST CASES FOR MOVC
 1439                                          ;-
 1440
 1441  004134  000017                          TMOVC:  .WORD  15.              ;# OF TEST CASES FOR MOVC
 1442
 1443  004136  000040                                  .WORD   40                      ;SRC.LEN
 1444  004140  061266                                  .WORD  BUFF2                    ;SRC.ADR
 1445  004142  000000                                  .WORD  0                        ;DST.LEN
 1446  004144  061166                                  .WORD  BUFF1                    ;DST.ADR
 1447  004146  000040                                  .WORD  40                       ;FILL CHAR.
 1448  004150  000000                                  .WORD   0                       ;SRC.BUFF.STATE
 1449  004152  177777                                  .WORD  -1                       ;DST.BUFF.STATE
 1450
 1451  004154  000050                                  .WORD  50               ;TEST CASE NUMBER 2
 1452  004156  061266                                  .WORD  BUFF2
 1453  004160  000020                                  .WORD  20
 1454  004162  061166                                  .WORD  BUFF1
```

```
$50133:
        CMP     BUFF2,#177777
        BEQ     $50134
        JSR     PC,ERROR
$50134:
        CMP     BUFF2+2,#20040
        BEQ     $50135
        JSR     PC,ERROR
$50135:
        MOV     #BUFF2+4,R0
        MOV     #BUFF2,TEMP0
        ADD     #BUFLEN-2,TEMP0
$50136:
        TST     (R0)+
        BEQ     $50137
        JSR     PC,ERROR
$50137:
        CMP     R0,TEMP0
        BEQ     $50140
        TST     ERRFLG
        BEQ     $50136
$50140:
        JMP     XMOVRC
```

```
1455  004164  000100                    .WORD  100
1456  004166  177777                    .WORD  -1
1457  004170  000000                    .WORD   0
1458
1459  004172  000045                    .WORD  45              ;TEST CASE NUMBER 3
1460  004174  061266                    .WORD  BUFF2
1461  004176  000030                    .WORD  30
1462  004200  061166                    .WORD  BUFF1
1463  004202  000007                    .WORD   7
1464  004204  000000                    .WORD   0
1465  004206  000001                    .WORD   1
1466
1467  004210  000000                    .WORD   0              ;TEST CASE NUMBER 4
1468  004212  061266                    .WORD  BUFF2
1469  004214  000060                    .WORD  60
1470  004216  061166                    .WORD  BUFF1
1471  004220  000010                    .WORD  10
1472  004222  000001                    .WORD   1
1473  004224  000000                    .WORD   0
1474
1475  004226  000046                    .WORD  46              ;TEST CASE NUMBER 5
1476  004230  061266                    .WORD  BUFF2
1477  004232  000132                    .WORD  BUFLEN+32
1478  004234  061166                    .WORD  BUFF1
1479  004236  000077                    .WORD  77
1480  004240  177777                    .WORD  -1
1481  004242  000001                    .WORD   1
1482
1483  004244  000000                    .WORD   0              ;TEST CASE NUMBER 6
1484  004246  061266                    .WORD  BUFF2
1485  004250  000015                    .WORD  15
1486  004252  061166                    .WORD  BUFF1
1487  004254  000060                    .WORD  60
1488  004256  000001                    .WORD   1
148?  004260  177777                    .WORD  -1
1490
1491  004262  000043                    .WORD  43              ;TEST CASE NUMBER 7
1492  004264  061266                    .WORD  BUFF2
1493  004266  000070                    .WORD  70
1494  004270  061166                    .WORD  BUFF1
1495  004272  000370                    .WORD  370
1496  004274  000000                    .WORD   0
1497  004276  177777                    .WORD  -1
1498
1499  004300  000060                    .WORD  60              ;TEST CASE NUMBER 8
1500  004302  061166                    .WORD  BUFF1
1501  004304  000000                    .WORD   0
1502  004306  061266                    .WORD  BUFF2
1503  004310  000200                    .WORD  200
1504  004312  177777                    .WORD  -1
1505  004314  000000                    .WORD   0
1506
1507  004316  000120                    .WORD  BUFLEN+20       ;TEST CASE NUMBER 9
1508  004320  061166                    .WORD  BUFF1
1509  004322  000100                    .WORD  100
1510  004324  061266                    .WORD  BUFF2
```

```
 1511  004326  000002                        .WORD   2
 1512  004330  000000                        .WORD   0
 1513  004332  000001                        .WORD   1
 1514
 1515  004334  000015                        .WORD  15               ;TEST CASE NUMBER 10
 1516  004336  061166                        .WORD  BUFF1
 1517  004340  000000                        .WORD   0
 1518  004342  061266                        .WORD  BUFF2
 1519  004344  000016                        .WORD  16
 1520  004346  000001                        .WORD   1
 1521  004350  000000                        .WORD   0
 1522
 1523  004352  000077                        .WORD  77               ;TEST CASE NUMBER 11
 1524  004354  061166                        .WORD  BUFF1
 1525  004356  000021                        .WORD  21
 1526  004360  061266                        .WORD  BUFF2
 1527  004362  000300                        .WORD  300
 1528  004364  177777                        .WORD  -1
 1529  004366  000001                        .WORD   1
 1530
 1531  004370  000000                        .WORD   0               ;TEST CASE NUMBER 12
 1532  004372  061166                        .WORD  BUFF1
 1533  004374  000050                        .WORD  50
 1534  004376  061266                        .WORD  BUFF2
 1535  004400  000003                        .WORD   3
 1536  004402  000001                        .WORD   1
 1537  004404  177777                        .WORD  -1
 1538
 1539  004406  000014                        .WORD  14               ;TEST CASE NUMBER 13
 1540  004410  061166                        .WORD  BUFF1
 1541  004412  000042                        .WORD  42
 1542  004414  061266                        .WORD  BUFF2
 1543  004416  000030                        .WORD  30
 1544  004420  000000                        .WORD   0
 1545  004422  177777                        .WORD  -1
 1546
 1547  004424  000000                        .WORD   0               ;TEST CASE NUMBER 14
 1548  004426  061166                        .WORD  BUFF1
 1549  004430  000053                        .WORD  53
 1550  004432  061266                        .WORD  BUFF2
 1551  004434  000012                        .WORD  12
 1552  004436  000001                        .WORD   1
 1553  004440  000000                        .WORD   0
 1554
 1555  004442  000027                        .WORD  27               ;TEST CASE NUMBER 15
 1556  004444  061166                        .WORD  BUFF1
 1557  004446  000060                        .WORD  60
 1558  004450  061266                        .WORD  BUFF2
 1559  004452  000014                        .WORD  14
 1560  004454  177777                        .WORD  -1
 1561  004456  000001                        .WORD   1
 1562
 1563
 1564  004460  000002            TMOVCI:     .WORD   2               ;TEST CASE FOR IN-LINE
 1565  004462  061166                        .WORD  BUFF1
 1566  004464  000004                        .WORD   4
```

```
  1567  004466  061266                          .WORD  BUFF2
```

```
                                        .SBTTL  MOVRC
                                        ;;*****************************************************************
                                        ;
                                        ;  MOVRC TEST
                                        ;
                                        ;;*****************************************************************

004470                                  INLINE  <XMOVRC:>
004470                                                                                  XMOVRC:
004470                                  INLINE  <SCOPE>
004470  000004                                                                        SCOPE
004472                                  LET $TIMES := #20               ;ITERATION COUNT
004472  012737  000020  000404                                                       MOV     #20,$TIMES
004500                                  LET COUNT := TMOVRC             ;GET TEST COUNT
004500  013737  006000  000466                                                       MOV     TMOVRC,COUNT
004506                                  LET TSTCAS := #TMOVRC+2         ;POINT TO FIRST TEST CASE
004506  012737  006002  000542                                                       MOV     #TMOVRC+2,TSTCAS
                                        ;REPEAT
004514                                  INLINE  <$5031:>
004514                                                                                  $5031:

                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-

004514                                          LET R0 := TSTCAS
004514  013700  000542                                                               MOV     TSTCAS,R0
004520                                          LET DATA00 := (R0)+             ;SRC.LEN
004520  012037  000560                                                               MOV     (R0)+,DATA00
004524                                          LET DATA01 := (R0)+             ;SRC.ADR
004524  012037  000562                                                               MOV     (R0)+,DATA01
004530                                          LET DATA02 := (R0)+             ;DST.LEN
004530  012037  000564                                                               MOV     (R0)+,DATA02
004534                                          LET DATA03 := (R0)+             ;DST.ADR
004534  012037  000566                                                               MOV     (R0)+,DATA03
004540                                          LET DATA04 := (R0)+             ;FILL CHAR.
004540  012037  000570                                                               MOV     (R0)+,DATA04
004544                                          LET DATA05 := (R0)+             ;SRC.BUFF.STATE
004544  012037  000572                                                               MOV     (R0)+,DATA05
004550                                          LET DATA06 := (R0)              ;DST.BUFF.STATE
004550  011037  000574                                                               MOV     (R0),DATA06

                                                ;+
                                                ; SET UP GPR'S, EXPECTED GPR'S AND
                                                ; CONDITION CODES, AND BUFFERS.
                                                ;-

004554                                          LET R0 := DATA00
004554  013700  000560                                                               MOV     DATA00,R0
004560                                          LET R1 := DATA01
004560  013701  000562                                                               MOV     DATA01,R1
004564                                          LET R2 := DATA02
004564  013702  000564                                                               MOV     DATA02,R2
004570                                          LET R3 := DATA03
004570  013703  000566                                                               MOV     DATA03,R3
004574                                          LET R4 := DATA04
```

```
1624  004574  013704  000570                    IF #1 SETIN COUNT THEN                                  MOV     DATA04,R4
1625  004600                                                                                            BIT     #1,COUNT
1626  004600  032737  000001  000466                                                                    BEQ     $50141
1627  004606  001403
1628  004610                                       LET R5 := #177777                                    MOV     #177777,R5
1629  004610  012705  177777                    ELSE                                                    BR      $50142
1630  004614
1631  004614  000401                                                                          $50141:
1632  004616                                       LET R5 := #0                                         CLR     R5
1633  004616
1634  004616  005005                             ENDIF
1635  004620                                                                                $50142:
1636  004620                                     INLINE  <CMP    R0,R2>                                 CMP     R0,R2
1637  004620
1638  004620  020002                             LET CC.EXP := PSW                                      MOV     PSW,CC.EXP
1639  004622
1640  004622  013737  177776  000520             LET CC.EXP := CC.EXP  CLR.BY  #177760                  BIC     #177760,CC.EXP
1641  004630
1642  004630  042737  177760  000520             IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN       BIT     #CBIT,CC.EXP
1643  004636                                                                                            BNE     $50143
1644  004636  032737  000001  000520                                                                    BIT     #ZBIT,CC.EXP
1645  004644  001004                                                                                    BEQ     $50144
1646  004646  032737  000004  000520
1647  004654  001403                                                                          $50143:
1648  004656                                       LET R0.EXP := #0                                     CLR     R0.EXP
1649  004656
1650  004656  005037  000522                    ELSE                                                    BR      $50145
1651  004662
1652  004662  000404                                                                          $50144:
1653  004664                                       LET R0.EXP := R0 - R2                                MOV     R0,R0.EXP
1654  004664                                                                                            SUB     R2,R0.EXP
1655  004664  010037  000522
1656  004670  160237  000522                    ENDIF                                           $50145:
1657  004674
1658  004674                                     LET R1.EXP := #0                                       CLR     R1.EXP
1659  004674
1660  004674  005037  000524                    LET R2.EXP := #0                                       CLR     R2.EXP
1661  004700
1662  004700  005037  000526                    LET R3.EXP := #0                                       CLR     R3.EXP
1663  004704
1664  004704  005037  000530                    LET R4.EXP := R4                                       MOV     R4,R4.EXP
1665  004710
1666  004710  010437  000532                    LET R5.EXP := R5                                       MOV     R5,R5.EXP
1667  004714
1668  004714  010537  000534                    LET BFADRS :- DATA01                                   MOV     DATA01,BFADRS
1669  004720
1670  004720  013737  000562  000540           IF DATA05 EQ #0 THEN                                   TST     DATA05
1671  004726                                                                                            BNE     $50146
1672  004726  005737  000572
1673  004732  001003                                 CALL CLRBUF                                        JSR     PC,CLRBUF
1674  004734
1675  004734  004737  055346                    ELSE                                                    BR      $50147
1676  004740                                                                                $50146:
1677  004740  000411                                IF DATA05 EQ #177777 THEN
1678  004742
1679  004742
```

```
 1680  004742  023727  000572  177777                                                    CMP     DATA05,#177777
 1681  004750  001003                                                                    BNE     $50150
 1682  004752
 1683  004752  004737  055410                                                            JSR     PC,SETBUF
 1684  004756
 1685  004756  000402                                                                    BR      $50151
 1686  004760                                                                  $50150:
 1687  004760
 1688  004760  004737  055454                                                            JSR     PC,ALTBUF
 1689  004764
 1690  004764                                                                  $50151:
 1691  004764
 1692  004764                                                                  $50147:
 1693  004764
 1694  004764  013737  000566  00054C                                                    MOV     DATA03,BFADRS
 1695  004772
 1696  004772  005737  000574                                                            TST     DATA06
 1697  004776  001003                                                                    BNE     $50152
 1698  005000
 1699  005000  004737  055346                                                            JSR     PC,CLRBUF
 1700  005004
 1701  005004  000411                                                                    BR      $50153
 1702  005006                                                                  $50152:
 1703  005006
 1704  005006  023727  000574  177777                                                    CMP     DATA06,#177777
 1705  005014  001003                                                                    BNE     $50154
 1706  005016
 1707  005016  004737  055410                                                            JSR     PC,SETBUF
 1708  005022
 1709  005022  000402                                                                    BR      $50155
 1710  005024                                                                  $50154:
 1711  005024
 1712  005024  004737  055454                                                            JSR     PC,ALTBUF
 1713  005030
 1714  005030                                                                  $50155:
 1715  005030
 1716  005030                                                                  $50153:
 1717  005030
 1718  005030  017737  173532  000536                                                    MOV     @DATA03,BF.EXP
 1719
 1720
 1721
 1722
 1723
 1724  005036
 1725  005036  076031                                                                    MOVRC
 1726
 1727
 1728
 1729
 1730
 1731  005040
 1732  005040  013737  177776  000516                                                    MOV     PSW,CC
 1733  005046
 1734  005046  042737  177760  000516                                                    BIC     #177760,CC
 1735  005054
```

```
                                    CALL SETBUF
                                  ELSE
                                    CALL ALTBUF
                                  ENDIF
                                ENDIF
                                LET BFADRS := DATA03
                                IF DATA06 EQ #0 THEN
                                  CALL CLRBUF
                                ELSE
                                  IF DATA06 FQ #177777 THEN
                                    CALL SETBUF
                                  ELSE
                                    CALL ALTBUF
                                  ENDIF
                                ENDIF
                                LET BF.EXP := @DATA03

                                ;+
                                ; DO THE CIS INSTRUCTION
                                ;-

                                INLINE  <MOVRC>

                                ;+
                                ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                ;-

                                LET CC := PSW
                                LET CC := CC CLR.BY #177760
                                IF CC NE CC.EXP THEN
```

```
1736  005054  023737  000516  000520                                          CMP     CC,CC.EXP
1737  005062  001402                                                          BEQ     $50156
1738  005064                          CALL ERROR
1739  005064  004737  056274                                                  JSR     PC,ERROR
1740  005070                      ENDIF
1741  005070                                                              $50156:
1742  005070                      IF R0 NE R0.EXP THEN
1743  005070  020037  000522                                                  CMP     R0,R0.EXP
1744  005074  001402                                                          BEQ     $50157
1745  005076                          CALL ERROR
1746  005076  004737  056274                                                  JSR     PC,ERROR
1747  005102                      ENDIF
1748  005102                                                              $50157:
1749  005102                      IF R1 NE R1.EXP THEN
1750  005102  020137  000524                                                  CMP     R1,R1.EXP
1751  005106  001402                                                          BEQ     $50160
1752  005110                          CALL ERROR
1753  005110  004737  056274                                                  JSR     PC,ERROR
1754  005114                      ENDIF
1755  005114                                                              $50160:
1756  005114                      IF R2 NE R2.EXP THEN
1757  005114  020237  000526                                                  CMP     R2,R2.EXP
1758  005120  001402                                                          BEQ     $50161
1759  005122                          CALL ERROR
1760  005122  004737  056274                                                  JSR     PC,ERROR
1761  005126                      ENDIF
1762  005126                                                              $50161:
1763  005126                      IF R3 NE R3.EXP THEN
1764  005126  020337  000530                                                  CMP     R3,R3.EXP
1765  005132  001402                                                          BEQ     $50162
1766  005134                          CALL ERROR
1767  005134  004737  056274                                                  JSR     PC,ERROR
1768  005140                      ENDIF
1769  005140                                                              $50162:
1770  005140                      IF R4 NE R4.EXP THEN
1771  005140  020437  000532                                                  CMP     R4,R4.EXP
1772  005144  001402                                                          BEQ     $50163
1773  005146                          CALL ERROR
1774  005146  004737  056274                                                  JSR     PC,ERROR
1775  005152                      ENDIF
1776  005152                                                              $50163:
1777  005152                      IF R5 NE R5.EXP THEN
1778  005152  020537  000534                                                  CMP     R5,R5.EXP
1779  005156  001402                                                          BEQ     $50164
1780  005160                          CALL ERROR
1781  005160  004737  056274                                                  JSR     PC,ERROR
1782  005164                      ENDIF
1783  005164                                                              $50164:
1784
1785                            ;+
1786                            ; CHECK ENTIRE DESTINATION BUFFER FOR CORRECT RESULTS
1787                            ;-
1738
1789  005164                      LET ERRFLG := #0
1790  005164  005037  000454                                                  CLR     ERRFLG
1791  005170                      LET R1 := DATA03
```

```
1792  005170  013701  000566                    IF DATA00 HIS DATA02 THEN
1793  005174
1794  005174  023737  000560  000564
1795  005202  103424
1796  005204                                      LET R3 := DATA02
1797  005204  013703  000564
1798  005210                                      LET R0 := DATA01 + DATA00 - DATA02
1799  005210  013700  000562
1800  005214  063700  000560
1801  005220  163700  000564
1802  005224                                      WHILE R3 NE #0 AND ERRFLG EQ #0 DO
1803  005224
1804  005224  005703
1805  005226  001411
1806  005230  005737  000454
1807  005234  001006
1808  005236                                        IFB (R0)+ NE (R1)+ THEN
1809  005236  122021
1810  005240  001402
1811  005242                                              CALL ERROR
1812  005242  004737  056274
1813  005246                                        ENDIF
1814  005246
1815  005246                                        LET R3 := R3 - #1
1816  005246  005303
1817  005250                                      ENDDO
1818  005250  000765
1819  005252
1820  005252                                    ELSE
1821  005252  000455
1822  005254                                      REPEAT
1823  005254
1824  005254
1825  005254                                            IFB (R1)+ NE DATA04 THEN
1826  005254  122137  000570
1827  005260  001402
1828  005262                                                  CALL ERROR
1829  005262  004737  056274
1830  005266                                            ENDIF
1831  005266
1832  005266                                      LET TEMP0 := DATA03 + DATA02 - DATA00
1833  005266  013737  000566  000474
1834  005274  063737  000564  000474
1835  005302  163737  000560  000474
1836  005310                                      UNTIL R1 EQ TEMP0 OR ERRFLG NE #0
1837  005310  020137  000474
1838  005314  001403
1839  005316  005737  000454
1840  005322  001754
1841  005324
1842  005324                                      LET R0 := DATA01
1843  005324  013700  000562
1844  005330                                      LET R1 := DATA03 + DATA02 - DATA00
1845  005330  013701  000566
1846  005334  063701  000564
1847  005340  163701  000560
```

```
                        MOV     DATA03,R1

                        CMP     DATA00,DATA02
                        BLO     $50165

                        MOV     DATA02,R3

                        MOV     DATA01,R0
                        ADD     DATA00,R0
                        SUB     DATA02,R0

$50166:
                        TST     R3
                        BEQ     $50167
                        TST     ERRFLG
                        BNE     $50167

                        CMPB    (R0)+,(R1)+
                        BEQ     $50170

                        JSR     PC,ERROR

$50170:

                        DEC     R3

                        BR      $50166
$50167:

                        BR      $50171
$50165:

$50172:

                        CMPB    (R1)+,DATA04
                        BEQ     $50173

                        JSR     PC,ERROR

$50173:

                        MOV     DATA03,TEMP0
                        ADD     DATA02,TEMP0
                        SUB     DATA00,TEMP0

                        CMP     R1,TEMP0
                        BEQ     $50174
                        TST     ERRFLG
                        BEQ     $50172
$50174:

                        MOV     DATA01,R0

                        MOV     DATA03,R1
                        ADD     DATA02,R1
                        SUB     DATA00,R1
```

```
1848  005344                                    LET TEMP0 := DATA03 + DATA02
1849  005344  013737  000566  000474                                          MOV     DATA03,TEMP0
1850  005352  063737  000564  000474                                          ADD     DATA02,TEMP0
1851  005360                                    WHILE R1 NE TEMP0 AND ERRFLG NE #0 DO
1852  005360                                                                $50175:
1853  005360  020137  000474                                                 CMP     R1,TEMP0
1854  005364  001410                                                        BEQ     $50176
1855  005366  005737  000454                                                TST     ERRFLG
1856  005372  001405                                                        BEQ     $50176
1857  005374                                        IFB (R0)+ NE (R1)+ THEN
1858  005374  122021                                                        CMPB    (R0)+,(R1)+
1859  005376  001402                                                        BEQ     $50177
1860  005400                                            CALL ERROR
1861  005400  004737  056274                                                JSR     PC,ERROR
1862  005404                                        ENDIF
1863  005404                                                                $50177:
1864  005404                                    ENDDO
1865  005404  000765                                                        BR      $50175
1866  005406                                                                $50176:
1867  005406                                ENDIF
1868  005406                                                                $50171:
1869  005406                                IF DATA02 LO #BUFLEN THEN
1870  005406  023727  000564  000100                                          CMP     DATA02,#BUFLEN
1871  005414  103025                                                        BHIS    $50200
1872  005416                                    LET R0 := DATA03 + DATA02
1873  005416  013700  000566                                                MOV     DATA03,R0
1874  005422  063700  000564                                                ADD     DATA02,R0
1875  005426                                    REPEAT
1876  005426                                                                $50201:
1877  005426                                      IFB (R0)+ NE BF.EXP THEN
1878  005426  122037  000536                                                 CMPB    (R0)+,BF.EXP
1879  005432  001402                                                        BEQ     $50202
1880  005434                                        CALL ERROR
1881  005434  004737  056274                                                JSR     PC,ERROR
1882  005440                                      ENDIF
1883  005440                                                                $50202:
1884  005440                                    LET TEMP0 := DATA03 + #BUFLEN
1885  005440  013737  000566  000474                                          MOV     DATA03,TEMP0
1886  005446  062737  000100  000474                                          ADD     #BUFLEN,TEMP0
1887  005454                                    UNTIL R0 EQ TEMP0 OR ERRFLG NE #0
1888  005454  020037  000474                                                 CMP     R0,TEMP0
1889  005460  001403                                                        BEQ     $50203
1890  005462  005737  000454                                                TST     ERRFLG
1891  005466  001757                                                        BEQ     $50201
1892  005470                                                                $50203:
1893  005470                                ENDIF
1894  005470                                                                $50200:
1895  005470                                LET TSTCAS := TSTCAS + #'6
1896  005470  062737  000016  000542                                          ADD     #16,TSTCAS
1897  005476                                LET COUNT := COUNT - #1
1898  005476  005337  000466                                                DEC     COUNT
1899                                    ;UNTIL COUNT EQ #0
1900  005502                            IF COUNT NE #0 THEN
1901  005502  005737  000466                                                TST     COUNT
1902  005506  001402                                                        BEQ     $50204
1903  005510                                INLINE  <JMP        $5031>
```

```
1904  005510  000137  004514                                                    JMP     $5031
1905  005514                        ENDIF
1906  005514                                                            $50204:
1907
1908
1909                                ;+
1910                                ; DO ONE INLINE CASE - MOVRCI
1911                                ;-
1912
1913  005514                        LET BFADRS := #BUFF1
1914  005514  012737  061166  000540                                            MOV     #BUFF1,BFADRS
1915  005522                        CALL SETBUF
1916  005522  004737  055410                                                    JSR     PC,SETBUF
1917  005526                        LET BFADRS := #BUFF2
1918  005526  012737  061266  00054C                                            MOV     #BUFF2,BFADRS
1919  005534                        CALL CLRBUF
1920  005534  004737  055346                                                    JSR     PC,CLRBUF
1921  005540                        LET R0 := #125252
1922  005540  012700  125252                                                    MOV     #125252,R0
1923  005544                        LET R1 := #125252
1924  005544  012701  125252                                                    MOV     #125252,R1
1925  005550                        LET R2 := #125252
1926  005550  012702  125252                                                    MOV     #125252,R2
1927  005554                        LET R3 := #125252
1928  005554  012703  125252                                                    MOV     #125252,R3
1929  005560                        LET R4 := #125252
1930  005560  012704  125252                                                    MOV     #125252,R4
1931  005564                        LET R5 := #125252
1932  005564  012705  125252                                                    MOV     #125252,R5
1933  005570                        LET ERRFLG := #0
1934  005570  005037  000454                                                    CLR     ERRFLG
1935  005574                        INLINE  <MOVRCI>
1936  005574  076131                                                            MOVRCI
1937  005576                        INLINE  <.WORD  TMVRCI>         ;SRC.DSCR.PTR
1938  005576  006072                                                            .WORD   TMVRCI
1939  005600                        INLINE  <.WORD  TMVRCI+4>       ;DST.DSCR.PTR
1940  005600  006076                                                            .WORD   TMVRCI+4
1941  005602                        INLINE  <.WORD  40>             ;FILL CHARACTER
1942  005602  000040                                                            .WORD   40
1943  005604                        IFCOND CS THEN
1944  005604  103003                                                            BCC     $50205
1945  005606                           IFCOND EQ THEN
1946  005606  001002                                                            BNE     $50206
1947  005610                                CALL ERROR
1948  005610  004737  056274                                                    JSR     PC,ERROR
1949  005614                           ENDIF
1950  005614                                                            $50206:
1951  005614                        ENDIF
1952  005614
1953  005614                        IF R0 NE #125252 THEN                $50205:
1954  005614  020027  125252                                                    CMP     R0,#125252
1955  005620  001402                                                            BEQ     $50207
1956  005622                           CALL ERROR
1957  005622  004737  056274                                                    JSR     PC,ERROR
1958  005626                        ENDIF
1959  005626                                                            $50207:
```

```
1960  005626                          IF R1 NE #125252 THEN
1961  005626  020127  *25252                                        CMP     R1,#125252
1962  005632  001402                                                BEQ     $50210
1963  005634
1964  005634  004737  056274              CALL ERROR                JSR     PC,ERROR
1965  005640                          ENDIF
1966  005640                                                       $50210:
1967  005640                          IF R2 NE #125252 THEN
1968  005640  020227  125252                                        CMP     R2,#125252
1969  005644  001402                                                BEQ     $50211
1970  005646
1971  005646  004737  056274              CALL ERROR                JSR     PC,ERROR
1972  005652                          ENDIF
1973  005652                                                       $50211:
1974  005652                          IF R3 NE #125252 THEN
1975  005652  020327  125252                                        CMP     R3,#125252
1976  005656  001402                                                BEQ     $50212
1977  005660
1978  005660  004737  056274              CALL ERROR                JSR     PC,ERROR
1979  005664                          ENDIF
1980  005664                                                       $50212:
1981  005664                          IF R4 NE #125252 THEN
1982  005664  020427  125252                                        CMP     R4,#125252
1983  005670  001402                                                BEQ     $50213
1984  005672
1985  005672  004737  056274              CALL ERROR                JSR     PC,ERROR
1986  005676                          ENDIF
1987  005676                                                       $50213:
1988  005676                          IF R5 NE #125252 THEN
1989  005676  020527  125252                                        CMP     R5,#125252
1990  005702  001402                                                BEQ     $50214
1991  005704
1992  005704  004737  056274              CALL ERROR                JSR     PC,ERROR
1993  005710                          ENDIF
1994  005710                                                       $50214:
1995  005710                          IF BUFF2 NE #20040 THEN
1996  005710  023727  061266  020040                                CMP     BUFF2,#20040
1997  005716  001402                                                BEQ     $50215
1998  005720
1999  005720  004737  056274              CALL ERROR                JSR     PC,ERROR
2000  005724                          ENDIF
2001  005724                                                       $50215:
2002  005724                          IF BUFF2+2 NE #177777 THEN
2003  005724  023727  061270  177777                                CMP     BUFF2+2,#177777
2004  005732  001402                                                BEQ     $50216
2005  005734
2006  005734  004737  056274              CALL ERROR                JSR     PC,ERROR
2007  005740                          ENDIF
2008  005740                                                       $50216:
2009  005740                          LET ERRFLG := #0
2010  005740  005037  000454                                        CLR     ERRFLG
2011  005744                          LET R0 := #BUFF2+4
2012  005744  012700  061272                                        MOV     #BUFF2+4,R0
2013  005750                          REPEAT
2014  005750                                                       $50217:
2015  005750                              IF (R0)+ NE #0 THEN
```

```
2016  005750  005720                                                          TST     (R0)+
2017  005752  001402                                                          BEQ     $50220
2018  005754                          CALL ERROR
2019  005754  004737  056274                                                  JSR     PC,ERROR
2020  005760                        ENDIF
2021  005760                                                          $50220:
2022  005760                      UNTIL R0 EQ #BUFF2+BUFLEN-2 OR ERRFLG NE #0
2023  005760  020027  061364                                                  CMP     R0,#BUFF2+BUFLEN
2024  005764  001403                                                          BEQ     $50221
2025  005766  005737  000454                                                  TST     ERRFLG
2026  005772  001766                                                          BEQ     $50217
2027  005774                                                          $50221:
2028  005774                      INLINE  <JMP    XMOVTC>
2029  005774  000137  006102                                                  JMP     XMOVTC
2030
2031                              ;+
2032                              ;TABLE OF TEST CASES FOR MOVRC
2033                              ;-
2034
2035  006000  000004              TMOVRC: .WORD   4               ;#OF TEST CASES FOR MOVRC
2036
2037  006002  000060                      .WORD   60                      ;SRC.LEN
2038  006004  061266                      .WORD   BUFF2                   ;SRC.ADR
2039  006006  000025                      .WORD   25                      ;DST.LEN
2040  006010  061166                      .WORD   BUFF1                   ;DST.ADR
2041  006012  000040                      .WORD   40                      ;FILL CHAR.
2042  006014  000000                      .WORD   0                       ;SRC.BUFF.STATE
2043  006016  000001                      .WORD   1                       ;DST.BUFF.STATE
2044
2045  006020  000017                      .WORD   17              ;TEST CASE NUMBER 2
2046  006022  061266                      .WORD   BUFF2
2047  006024  000050                      .WORD   50
2048  006026  061166                      .WORD   BUFF1
2049  006030  000100                      .WORD   100
2050  006032  000001                      .WORD   1
2051  006034  000000                      .WORD   0
2052
2053  006036  000030                      .WORD   30              ;TEST CASE NUMBER 3
2054  006040  061166                      .WORD   BUFF1
2055  006042  000012                      .WORD   12
2056  006044  061266                      .WORD   BUFF2
2057  006046  000077                      .WORD   77
2058  006050  000000                      .WORD   0
2059  006052  177777                      .WORD   -1
2060
2061  006054  000022                      .WORD   22              ;TEST CASE NUMBER 4
2062  006056  061166                      .WORD   BUFF1
2063  006060  000037                      .WORD   37
2064  006062  061166                      .WORD   BUFF1
2065  006064  000020                      .WORD   20
2066  006066  177777                      .WORD   -1
2067  006070  000001                      .WORD   1
2068
2069  006072  000002              TMVRC1: .WORD   2               ;TEST CASE FOR IN-LINE
2070  006074  061166                      .WORD   BUFF1
2071  006076  000004                      .WORD   4
```

```
  2072  006100  061266                          .WORD   BUFF2
```

```
                        .SBTTL  MOVTC
                        ;;*****************************************************************
                        ;
                        ;  MOVTC TEST
                        ;
                        ;;*****************************************************************
006102                  INLINE  <XMOVTC:>
006102                                                                          XMOVTC:
006102                  INLINE  <SCOPE>
006102  000004                                                                  SCOPE
006104                  LET $TIMES := #20               ;ITERATION COUNT
006104  012737  000020  000404                                                  MOV     #20,$TIMES
006112                  LET COUNT := TMOVTC             ;GET TEST COUNT
006112  013737  007436  000466                                                  MOV     TMOVTC,COUNT
006120                  LET TSTCAS := #TMOVTC+2         ;POINT TO FIRST TEST CASE
006120  012737  007440  000542                                                  MOV     #TMOVTC+2,TSTCAS
                        ;REPEAT
006126                  INLINE  <$5032:>
006126                                                                          $5032:
                                ;+
                                ; GET TEST DATA FROM TABLE
                                ;-
006126                          LET R0 := TSTCAS
006126  013700  000542                                                          MOV     TSTCAS,R0
006132                          LET DATA00 := (R0)+             ;SRC.LEN
006132  012037  000560                                                          MOV     (R0)+,DATA00
006136                          LET DATA01 := (R0)+             ;SRC.ADR
006136  012037  000562                                                          MOV     (R0)+,DATA01
006142                          LET DATA02 := (R0)+             ;DST.LEN
006142  012037  000564                                                          MOV     (R0)+,DATA02
006146                          LET DATA03 := (R0)+             ;DST.ADR
006146  012037  000566                                                          MOV     (R0)+,DATA03
006152                          LET DATA04 := (R0)+             ;FILL CHAR.
006152  012037  000570                                                          MOV     (R0)+,DATA04
006156                          LET DATA05 := (R0)+             ;SRC.BUFF.STATE
006156  012037  000572                                                          MOV     (R0)+,DATA05
006162                          LET DATA06 := (R0)              ;DST.BUFF.STATE
006162  011037  000574                                                          MOV     (R0),DATA06
                                ;+
                                ; SET UP GPR'S,
                                ; EXPECTED GPR'S AND CONDITION CODES,
                                ; AND BUFFERS.
                                ;-
006166                          LET R0 := DATA00
006166  013700  000560                                                          MOV     DATA00,R0
006172                          LET R1 := DATA01
006172  013701  000562                                                          MOV     DATA01,R1
006176                          LET R2 := DATA02
006176  013702  000564                                                          MOV     DATA02,R2
006202                          LET R3 := DATA03
006202  013703  000566                                                          MOV     DATA03,R3
006206                          LET R4 := DATA04
```

```
 2129  006206  013704  000570                                                                    MOV     DATA04,R4
 2130  006212
 2131  006212  012705  061366                                                                    MOV     #TRANS,R5
 2132  006216
 2133  006216  020002                                                                            CMP     R0,R2
 2134  006220
 2135  006220  013737  177776  000520                                                            MOV     PSW,CC.EXP
 2136  006226
 2137  006226  042737  177760  000520                                                            BIC     #177760,CC.EXP
 2138  006234
 2139  006234  032737  000001  000520                                                            BIT     #CBIT,CC.EXP
 2140  006242  001004                                                                            BNE     $50222
 2141  006244  032737  000004  000520                                                            BIT     #ZBIT,CC.EXP
 2142  006252  001403                                                                            BEQ     $50223
 2143  006254                                                                          $50222:
 2144  006254
 2145  006254  005037  000522                                                                    CLR     R0.EXP
 2146  006260
 2147  006260  000404                                                                            BR      $50224
 2148  006262                                                                          $50223:
 2149  006262
 2150  006262  010037  000522                                                                    MOV     R0,R0.EXP
 2151  006266  160237  000522                                                                    SUB     R2,R0.EXP
 2152  006272
 2153  006272                                                                          $50224:
 2154  006272
 2155  006272  005037  000524                                                                    CLR     R1.EXP
 2156  006276
 2157  006276  005037  000526                                                                    CLR     R2.EXP
 2158  006302
 2159  006302  005037  000530                                                                    CLR     R3.EXP
 2160  006306
 2161  006306  010437  000532                                                                    MOV     R4,R4.EXP
 2162  006312
 2163  006312  010537  000534                                                                    MOV     R5,R5.EXP
 2164  006316
 2165  006316  013737  000562  000540                                                            MOV     DATA01,BFADRS
 2166  006324
 2167  006324  005737  000572                                                                    TST     DATA05
 2168  006330  001003                                                                            BNE     $50225
 2169  006332
 2170  006332  004737  055346                                                                    JSR     PC,CLRBUF
 2171  006336
 2172  006336  000411                                                                            BR      $50226
 2173  006340                                                                          $50225:
 2174  006340
 2175  006340  023727  000572  177777                                                            CMP     DATA05,#177777
 2176  006346  001003                                                                            BNE     $50227
 2177  006350
 2178  006350  004737  055410                                                                    JSR     PC,SETBUF
 2179  006354
 2180  006354  000402                                                                            BR      $50230
 2181  006356                                                                          $50227:
 2182  006356
 2183  006356  004737  055454                                                                    JSR     PC,ALTBUF
 2184  006362
```

```
LET R5 := #TRANS

INLINE  <CMP    R0,R2>

LET CC.EXP := PSW

LET CC.EXP := CC.EXP  CLR.BY  #177760

IF #CBIT SETIN CC.EXP OR #ZBIT SETIN CC.EXP THEN

   LET R0.EXP := #0

ELSE

   LET R0.EXP := R0 - R2

ENDIF

LET R1.EXP := #0

LET R2.EXP := #0

LET R3.EXP := #0

LET R4.EXP := R4

LET R5.EXP := R5

LET BFADRS := DATA01

IF DATA05 EQ #0 THEN

   CALL CLRBUF

ELSE

   IF DATA05 EQ #177777 THEN

      CALL SETBUF

   ELSE

      CALL ALTBUF

   ENDIF
```

```
2185  006362                                    ENDIF                                  $50230:
2186  006362
2187  006362                                    LET BFADRS := DATA03                   $50226:
2188  006362
2189  006362  013737  000566  000540           IF DATA06 EQ #0 THEN                           MOV     DATA03,BFADRS
2190  006370
2191  006370  005737  000574                                                                  TST     DATA06
2192  006374  001003                                                                         BNE     $50231
2193  006376
2194  006376  004737  055346                        CALL CLRBUF                            JSR     PC,CLRBUF
2195  006402
2196  006402  000411                            ELSE                                       BR      $50232
2197  006404                                                                         $50231:
2198  006404
2199  006404  023727  000574  177777               IF DATA06 EQ #177777 THEN                 CMP     DATA06,#177777
2200  006412  001003                                                                         BNE     $50233
2201  006414
2202  006414  004737  055410                           CALL SETBUF                         JSR     PC,SETBUF
2203  006420
2204  006420  000402                               ELSE                                   BR      $50234
2205  006422                                                                         $50233:
2206  006422
2207  006422  004737  055454                           CALL ALTBUF                         JSR     PC,ALTBUF
2208  006426
2209  006426                                        ENDIF                              $50234:
2210  006426
2211  006426                                    ENDIF                                  $50232:
2212  006426
2213  006426  017737  172134  000536           LET BF.EXP := @DATA03                          MOV     @DATA03,BF.EXP
2214
2215                                            ;+
2216                                            ; SET UP THE TRANSLATION TABLE
2217                                            ;-
2218
2219  006434                                    DECR TEMP0 FROM #200 TO #1 BY #1
2220  006434  012737  000200  000474                                                         MOV     #200,TEMP0
2221  006442  000402                                                                       BR      $50235
2222  006444                                                                         $50236:
2223  006444  005337  000474                                                               DEC     TEMP0
2224  006450                                                                         $50235:
2225  006450  023727  000474  000001                                                       CMP     TEMP0,#1
2226  006456  002402                                                                       BLT     $50237
2227  006460
2228  006460  005025                              LET (R5)+ :- #0                          CLR     (R5)+
2229  006462
2230  006462  000770                            ENDDEC                                   BR      $50236
2231  006464                                                                         $50237:
2232  006464
2233  006464  012705  061366                    LET R5 := #TRANS                         MOV     #TRANS,R5
2234  006470
2235  006470  112715  000063                    LET (R5) :B= #63                         MOVB    #63,(R5)
2236  006474
2237  006474  112765  000314  000252            LET 252(R5) :B= #314                     MOVB    #314,252(R5)
2238  006502
2239  006502  112765  000125  000377            LET 377(R5) :B= #125                     MOVB    #125,377(R5)
2240
```

```
                                        ;+
                                        ; DO THE CIS INSTRUCTION
                                        ;-

006510                                  INLINE  <MOVTC>
006510  076032                                                                 MOVTC

                                        ;+
                                        ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                        ;-

006512                                  LET CC := PSW
006512  013737  177776  000516                                                  MOV     PSW,CC
006520                                  LET CC := CC CLR.BY #177760
006520  042737  177760  000516                                                  BIC     #177760,CC
006526                                  IF CC NE CC.EXP THEN
006526  023737  000516  000520                                                  CMP     CC,CC.EXP
006534  001402                                                                  BEQ     $50240
006536                                      CALL ERROR
006536  004737  056274                                                          JSR     PC,ERROR
006542                                  ENDIF
006542                                                                  $50240:
006542                                  IF R0 NE R0.EXP THEN
006542  020037  000522                                                          CMP     R0,R0.EXP
006546  001402                                                                  BEQ     $50241
006550                                      CALL ERROR
006550  004737  056274                                                          JSR     PC,ERROR
006554                                  ENDIF
006554                                                                  $50241:
006554                                  IF R1 NE R1.EXP THEN
006554  020137  000524                                                          CMP     R1,R1.EXP
006560  001402                                                                  BEQ     $50242
006562                                      CALL ERROR
006562  004737  056274                                                          JSR     PC,ERROR
006566                                  ENDIF
006566                                                                  $50242:
006566                                  IF R2 NE R2.EXP THEN
006566  020237  000526                                                          CMP     R2,R2.EXP
006572  001402                                                                  BEQ     $50243
006574                                      CALL ERROR
006574  004737  056274                                                          JSR     PC,ERROR
006600                                  ENDIF
006600                                                                  $50243:
006600                                  IF R3 NE R3.EXP THEN
006600  020337  000530                                                          CMP     R3,R3.EXP
006604  001402                                                                  BEQ     $50244
006606                                      CALL ERROR
006606  004737  056274                                                          JSR     PC,ERROR
006612                                  ENDIF
006612                                                                  $50244:
006612                                  IF R4 NE R4.EXP THEN
006612  020437  000532                                                          CMP     R4,R4.EXP
006616  001402                                                                  BEQ     $50245
006620                                      CALL ERROR
006620  004737  056274                                                          JSR     PC,ERROR
006624                                  ENDIF
```

```
2297  006624                                                                  $50245:
2298  006624                    IF R5 NE R5.EXP THEN
2299  006624  020537  000534                                                        CMP     R5,R5.EXP
2300  006630  001402                                                              BEQ     $50246
2301  006632                        CALL ERROR
2302  006632  004737  056274                                                     JSR     PC,ERROR
2303  006636                    ENDIF
2304  006636                                                                  $50246:
2305
2306                            ;+
2307                            ; CHECK ENTIRE DESTINATION BUFFER FOR CORRECT RESULTS
2308                            ;-
2309
2310  006636                    LET R0 := DATA03
2311  006636  013700  000566                                                     MOV     DATA03,R0
2312  006642                    LET R2 :B= @DATA01
2313  006642  117702  171714                                                     MOVB    @DATA01,R2
2314  006646                    LET R2 := R2 CLR.BY #177400
2315  006646  042702  177400                                                     BIC     #177400,R2
2316  006652                    LET R1 :B= TRANS(R2)
2317  006652  116201  061366                                                     MOVB    TRANS(R2),R1
2318  006656                    LET ERRFLG := #0
2319  006656  005037  000454                                                     CLR     ERRFLG
2320  006662                    IF DATA00 HIS DATA02 THEN
2321  006662  023737  000560  000564                                            CMP     DATA00,DATA02
2322  006670  103416                                                           BLO     $50247
2323  006672                        LET R3 := DATA02
2324  006672  013703  000564                                                     MOV     DATA02,R3
2325  006676                        WHILE R3 NE #0 AND ERRFLG EQ #0 DO
2326  006676                                                                  $50250:
2327  006676  005703                                                           TST     R3
2328  006700  001411                                                           BEQ     $50251
2329  006702  005737  000454                                                  TST     ERRFLG
2330  006706  001006                                                           BNE     $50251
2331  006710
2332  006710  122001                    IFB (R0)+ NE R1 THEN                  CMPB    (R0)+,R1
2333  006712  001402                                                           BEQ     $50252
2334  006714                            CALL ERROR
2335  006714  004737  056274                                                  JSR     PC,ERROR
2336  006720                        ENDIF
2337  006720                                                                  $50252:
2338  006720                        LET R3 := R3 - #1
2339  006720  005303                                                           DEC     R3
2340  006722                    ENDDO
2341  006722  000765                                                           BR      $50250
2342  006724                                                                  $50251:
2343  006724                ELSE
2344  006724  000440                                                           BR      $50253
2345  006726                                                                  $50247:
2346  006726                        LET R3 := DATA00
2347  006726  013703  000560                                                     MOV     DATA00,R3
2348  006732                        WHILE R3 NE #0 AND ERRFLG EQ #0 DO
2349  006732                                                                  $50254:
2350  006732  005703                                                           TST     R3
2351  006734  001411                                                           BEQ     $50255
2352  006736  005737  000454                                                  TST     ERRFLG
```

```
2353  006742  001006                        IFB (R0)+ NE R1 THEN                                BNE     $50255
2354  006744
2355  006744  122001                                                                            CMPB    (R0)+,R1
2356  006746  001402                                                                            BEQ     $50256
2357  006750                                    CALL ERROR
2358  006750  004737  056274                                                                    JSR     PC,ERROR
2359
2360  006754                                  ENDIF
2361  006754                                                                          $50256:
2362  006754                                  LET R3 := R3 - #1
2363  006754  005303                                                                            DEC     R3
2364  006756                                ENDDO
2365  006756  000765                                                                            BR      $50254
2366  006760                                                                          $50255:
2367  006760                                LET R0 := DATA03 + DATA00
2368  006760  013700  000566                                                                    MOV     DATA03,R0
2369  006764  063700  000560                                                                    ADD     DATA00,R0
2370  006770                                LET R3 := DATA02 - DATA00
2371  006770  013703  000564                                                                    MOV     DATA02,R3
2372  006774  163703  000560                                                                    SUB     DATA00,R3
2373  007000                                REPEAT
2374  007000                                                                          $50257:
2375  007000                                    IFB (R0)+ NE DATA04 THEN
2376  007000  122037  000570                                                                    CMPB    (R0)+,DATA04
2377  007004  001402                                                                            BEQ     $50260
2378  007006                                        CALL ERROR
2379  007006  004737  056274                                                                    JSR     PC,ERROR
2380  007012                                    ENDIF
2381  007012                                                                          $50260:
2382  007012                                    LET R3 := R3 - #1
2383  007012  005303                                                                            DEC     R3
2384  007014                                UNTIL R3 EQ #0 OR ERRFLG NE #0
2385  007014  005703                                                                            TST     R3
2386  007016  001403                                                                            BEQ     $50261
2387  007020  005737  000454                                                                    TST     ERRFLG
2388  007024  001765                                                                            BEQ     $50257
2389  007026                                                                          $50261:
2390  007026                              ENDIF
2391  007026                                                                          $50253:
2392  007026                              IF DATA02 LO #BUFLEN THEN
2393  007026  023727  000564  000100                                                            CMP     DATA02,#BUFLEN
2394  007034  103027                                                                            BHIS    $50262
2395  007036                                    LET TEMP0 := DATA03 + #BUFLEN - #1
2396  007036  013737  000566  000474                                                            MOV     DATA03,TEMP0
2397  007044  062737  000100  000474                                                            ADD     #BUFLEN,TEMP0
2398  007052  005337  000474                                                                    DEC     TEMP0
2399  007056                                    LET R0 := DATA03 + DATA02
2400  007056  013700  000566                                                                    MOV     DATA03,R0
2401  007062  063700  000564                                                                    ADD     DATA02,R0
2402  007066                                    REPEAT
2403  007066                                                                          $50263:
2404  007066                                        IFB (R0)+ NE BF.EXP THEN
2405  007066  122037  000536                                                                    CMPB    (R0)+,BF.EXP
2406  007072  001402                                                                            BEQ     $50264
2407  007074                                            CALL ERROR
2408  007074  004737  056274                                                                    JSR     PC,ERROR
```

```
2409  007100                                    ENDIF
2410  007100                                                                          $50264:
2411  007100                                    UNTIL R0 EQ TEMP0 OR ERRFLG NE #0
2412  007100  020037  000474                                                                CMP     R0,TEMP0
2413  007104  001403                                                                        BEQ     $50265
2414  007106  005737  000454                                                                TST     ERRFLG
2415  007112  001765                                                                        BEQ     $50263
2416  007114                                                                          $50265:
2417  007114                                ENDIF
2418  007114                                                                          $50262:
2419  007114                                LET TSTCAS := TSTCAS + #16
2420  007114  062737  000016  000542                                                        ADD     #16,TSTCAS
2421  007122                                LET COUNT := COUNT - #1
2422  007122  005337  000466                                                                DEC     COUNT
2423                                  ;UNTIL COUNT EQ #0
2424  007126                          IF COUNT NE #0 THEN
2425  007126  005737  000466                                                                TST     COUNT
2426  007132  001402                                                                        BEQ     $50266
2427  007134                                INLINE  <JMP    $5032>
2428  007134  000137  006126                                                                JMP     $5032
2429  007140                          ENDIF
2430  007140                                                                          $50266:
2431
2432
2433                                  ;+
2434                                  ; DO ONE INLINE CASE - MOVTCI
2435                                  ;-
2436
2437  007140                          LET BFADRS := #BUFF1
2438  007140  012737  061166  000540                                                        MOV     #BUFF1,BFADRS
2439  007146                          CALL CLRBUF
2440  007146  004737  055346                                                                JSR     PC,CLRBUF
2441  007152                          LET BFADRS := #BUFF2
2442  007152  012737  061266  000540                                                        MOV     #BUFF2,BFADRS
2443  007160                          CALL SETBUF
2444  007160  004737  055410                                                                JSR     PC,SETBUF
2445  007164                          LET R0 := #125252
2446  007164  012700  125252                                                                MOV     #125252,R0
2447  007170                          LET R1 := #125252
2448  007170  012701  125252                                                                MOV     #125252,R1
2449  007174                          LET R2 := #125252
2450  007174  012702  125252                                                                MOV     #125252,R2
2451  007200                          LET R3 := #125252
2452  007200  012703  125252                                                                MOV     #125252,R3
2453  007204                          LET R4 := #125252
2454  007204  012704  125252                                                                MOV     #125252,R4
2455  007210                          LET R5 := #125252
2456  007210  012705  125252                                                                MOV     #125252,R5
2457  007214                          LET TRANS := #70707
2458  007214  012737  070707  061366                                                        MOV     #70707,TRANS
2459  007222                          INLINE  <MOVTCI>
2460  007222  076132                                                                MOVTCI
2461  007224                          INLINE  <.WORD  TMVTCI>
2462  007224  007530                                                                .WORD   TMVTCI
2463  007226                          INLINE  <.WORD  TMVTCI+4>
2464  007226  007534                                                                .WORD   TMVTCI+4
```

```
2465  007230                          INLINE  <.WORD  40>
2466  007230  000040                                          .WORD   40
2467  007232                          INLINE  <.WORD  TRANS>
2468  007232  061366                                          .WORD   TRANS
2469  007234                          IFCOND CS THEN
2470  007234  103003                                          BCC     $50267
2471  007236                                  IFCOND EQ THEN
2472  007236  001002                                          BNE     $50270
2473  007240                                      CALL ERROR
2474  007240  004737  056274                                  JSR     PC,ERROR
2475  007244                                  ENDIF
2476  007244                                                  $50270:
2477  007244                          ENDIF
2478  007244                                                  $50267:
2479  007244                          IF R0 NE #125252 THEN
2480  007244  020027  125252                                  CMP     R0,#125252
2481  007250  001402                                          BEQ     $50271
2482  007252                                  CALL ERROR
2483  007252  004737  056274                                  JSR     PC,ERROR
2484  007256                          ENDIF
2485  007256                                                  $50271:
2486  007256                          IF R1 NE #125252 THEN
2487  007256  020127  125252                                  CMP     R1,#125252
2488  007262  001402                                          BEQ     $50272
2489  007264                                  CALL ERROR
2490  007264  004737  056274                                  JSR     PC,ERROR
2491  007270                          ENDIF
2492  007270                                                  $50272:
2493  007270                          IF R2 NE #125252 THEN
2494  007270  020227  125252                                  CMP     R2,#125252
2495  007274  001402                                          BEQ     $50273
2496  007276                                  CALL ERROR
2497  007276  004737  056274                                  JSR     PC,ERROR
2498  007302                          ENDIF
2499  007302                                                  $50273:
2500  007302                          IF R3 NE #125252 THEN
2501  007302  020327  125252                                  CMP     R3,#125252
2502  007306  001402                                          BEQ     $50274
2503  007310                                  CALL ERROR
2504  007310  004737  056274                                  JSR     PC,ERROR
2505  007314                          ENDIF
2506  007314                                                  $50274:
2507  007314                          IF R4 NE #125252 THEN
2508  007314  020427  125252                                  CMP     R4,#125252
2509  007320  001402                                          BEQ     $50275
2510  007322                                  CALL ERROR
2511  007322  004737  056274                                  JSR     PC,ERROR
2512  007326                          ENDIF
2513  007326                                                  $50275:
2514  007326                          IF R5 NE #125252 THEN
2515  007326  020527  125252                                  CMP     R5,#125252
2516  007332  001402                                          BEQ     $50276
2517  007334                                  CALL ERROR
2518  007334  004737  056274                                  JSR     PC,ERROR
2519  007340                          ENDIF
2520  007340                                                  $50276:
```

```
2521  007340                          IF BUFF2 NE #143707 THEN
2522  007340  023727  061266  143707                                    CMP     BUFF2,#143707
2523  007346  001402                                                   BEQ     $50277
2524  007350                                  CALL ERROR
2525  007350  004737  056274                                          JSR     PC,ERROR
2526  007354                          ENDIF
2527  007354                                                          $50277:
2528  007354                          IF BUFF2+2 NE #20040 THEN
2529  007354  023727  061270  020040                                    CMP     BUFF2+2,#20040
2530  007362  001402                                                   BEQ     $50300
2531  007364                                  CALL ERROR
2532  007364  004737  056274                                          JSR     PC,ERROR
2533  007370                          ENDIF
2534  007370                                                          $50300:
2535  007370                          LET R0 := #BUFF2 + #4
2536  007370  012700  061266                                          MOV     #BUFF2,R0
2537  007374  062700  000004                                          ADD     #4,R0
2538  007400                          LET ERRFLG := #0
2539  007400  005037  000454                                          CLR     ERRFLG
2540  007404                          REPEAT
2541  007404                                                          $50301:
2542  007404                                  IF (R0)+ NE #177777 THEN
2543  007404  022027  177777                                          CMP     (R0)+,#177777
2544  007410  001402                                                   BEQ     $50302
2545  007412                                     CALL ERROR
2546  007412  004737  056274                                          JSR     PC,ERROR
2547  007416                                  ENDIF
2548  007416                                                          $50302:
2549  007416                          UNTIL R0 EQ #BUFF2+BUFLEN OR ERRFLG NE #0
2550  007416  020027  061366                                          CMP     R0,#BUFF2+BUFLEN
2551  007422  001403                                                   BEQ     $50303
2552  007424  005737  000454                                          TST     ERRFLG
2553  007430  001765                                                   BEQ     $50301
2554  007432                                                          $50303:
2555  007432                          INLINE  <JMP    XLOCC>
2556  007432  000137  007540                                          JMP     XLOCC
2557
2558                                  ;+
2559                                  ; TABLE OF TEST CASES FOR MOVTC
2560                                  ;-
2561
2562  007436  000004                  TMOVTC: .WORD   4               ;#OF TEST CASES FOR MOVTC
2563
2564  007440  000061                          .WORD   61                      ;SRC.LEN
2565  007442  061266                          .WORD   BUFF2                   ;SRC.ADR
2566  007444  000027                          .WORD   27                      ;DST.LEN
2567  007446  061166                          .WORD   BUFF1                   ;DST.ADR
2568  007450  000040                          .WORD   40                      ;FILL CHARACTER
2569  007452  000000                          .WORD   0                       ;SRC.BUFF.STATE
2570  007454  000001                          .WORD   1                       ;DST.BUFF.STATE
2571
2572  007456  000055                          .WORD   55              ;TEST CASE NUMBER 2
2573  007460  061266                          .WORD   BUFF2
2574  007462  000075                          .WORD   75
2575  007464  061166                          .WORD   BUFF1
2576  007466  000100                          .WORD   100
```

```
 2577  007470  000001                          .WORD   1
 2578  007472  000C00                          .WORD   0
 2579
 2580  007474  000032                          .WORD   32              ;TEST CASE NUMBER 3
 2581  007476  061166                          .WORD   BUFF1
 2582  007500  000031                          .WORD   31
 2583  007502  061266                          .WORD   BUFF2
 2584  007504  000073                          .WORD   73
 2585  007506  000000                          .WORD   0
 2586  007510  177777                          .WORD   -1
 2587
 2588  007512  000005                          .WORD   5               ;TEST CASE NUMBER 4
 2589  007514  061166                          .WORD   BUFF1
 2590  007516  000026                          .WORD   26
 2591  007520  061266                          .WORD   BUFF2
 2592  007522  000020                          .WORD   20
 2593  007524  177777                          .WORD   -1
 2594  007526  000001                          .WORD   1
 2595
 2596  007530  000002                TMVTCI:   .WORD   2               ;TEST CASE FOR INLINE
 2597  007532  061166                          .WORD   BUFF1
 2598  007534  000004                          .WORD   4
 2599  007536  061266                          .WORD   BUFF2
```

```
                        .SBTTL  LOCC
                        ;;*****************************************************************
                        ;
                        ;  LOCC TEST
                        ;
                        ;;*****************************************************************
007540                  INLINE  <XLOCC:>
007540                                                                  XLOCC:
007540                  INLINE  <SCOPE>
007540  000004                                                          SCOPE
007542                  LET $TIMES := #20               ;ITERATION COUNT
007542  012737  000020  000404                                         MOV     #20,$TIMES
007550                  LET COUNT := TLOCC              ;GET TEST COUNT
007550  013737  010372  000466                                         MOV     TLOCC,COUNT
007556                  LET TSTCAS := #TLOCC+2          ;POINT TO FIRST TEST CASE
007556  012737  010374  000542                                         MOV     #TLOCC+2,TSTCAS
                        ;REPEAT
007564                  INLINE  <$5040:>
007564                                                                  $5040:
                                ;+
                                ; GET TEST DATA FROM TABLE
                                ;
007564                          LET R0 := TSTCAS
007564  013700  000542                                                  MOV     TSTCAS,R0
007570                          LET DATA00 := (R0)+             ;SRC.LEN
007570  012037  000560                                                  MOV     (R0)+,DATA00
007574                          LET DATA01 := (R0)+             ;CHAR.SEARCHED FOR
007574  012037  000562                                                  MOV     (R0)+,DATA01
007600                          LET DATA02 := (R0)              ;OFFSET
007600  011037  000564                                                  MOV     (R0),DATA02
                                ;+
                                ; SET UP GPR'S,
                                ; EXPECTED GPR'S AND CONDITION CODES,
                                ; AND SOURCE BUFFER.
                                ;-
007604                          LET R0 := DATA00
007604  013700  000560                                                  MOV     DATA00,R0
007610                          LET R1 := #BUFF1
007610  012701  061166                                                  MOV     #BUFF1,R1
007614                          LET R4 := DATA01
007614  013704  000562                                                  MOV     DATA01,R4
007620                          INLINE  <BIT    #BIT00,COUNT>
007620  032737  000001  000466                                         BIT     #BIT00,COUNT
007626                          IFCOND EQ THEN
007626  001004                                                          BNE     $50304
007630                              LET R2 := #0
007630  005002                                                          CLR     R2
007632                              LET R3 := #0
007632  005003                                                          CLR     R3
007634                              LET R5 := #0
007634  005005                                                          CLR     R5
007636                          ELSE
007636  000406                                                          BR      $50305
007640                                                          $50304:
```

```
2656  007640
2657  007640  012702  177777          LET R2 := #177777                    MOV     #177777,R2
2658  007644
2659  007644  012703  177777          LET R3 := #177777                    MOV     #177777,R3
2660  007650
2661  007650  012705  177777          LET R5 := #177777                    MOV     #177777,R5
2662  007654                        ENDIF
2663  007654                        IF DATA02 HI DATA00 THEN           $50305:
2664  007654
2665  007654  023737  000564  000560                                       CMP     DATA02,DATA00
2666  007662  101411                                                       BLOS    $50306
2667  007664
2668  007664  005037  000522          LET R0.EXP := #0                     CLR     R0.EXP
2669  007670
2670  007670  012737  061166  000524  LET R1.EXP := #BUFF1 + DATA00        MOV     #BUFF1,R1.EXP
2671  007676  063737  000560  000524                                       ADD     DATA00,R1.EXP
2672  007704
2673  007704  000414                  ELSE                                 BR      $50307
2674  007706                                                         $50306:
2675  007706
2676  007706  013737  000560  000522  LET R0.EXP := DATA00 - DATA02        MOV     DATA00,R0.EXP
2677  007714  163737  000564  000522                                       SUB     DATA02,R0.EXP
2678  007722
2679  007722  012737  061166  000524  LET R1.EXP :- #BUFF1 + DATA02        MOV     #BUFF1,R1.EXP
2680  007730  063737  000564  000524                                       ADD     DATA02,R1.EXP
2681  007736                        ENDIF
2682  007736                        LET R2.EXP := R2                     $50307:
2683  007736
2684  007736  010237  000526          LET R3.EXP := R3                     MOV     R2,R2.EXP
2685  007742
2686  007742  010337  000530          LET R4.EXP :- R4                     MOV     R3,R3.EXP
2687  007746
2688  007746  010437  000532          LET R5.EXP := R5                     MOV     R4,R4.EXP
2689  007752
2690  007752  010537  000534          INLINE  <TST   R0.EXP>               MOV     R5,R5.EXP
2691  007756
2692  007756  005737  000522          LET CC.EXP := PSW                    TST   R0.EXP
2693  007762
2694  007762  013737  177776  000520  LET CC.EXP := CC.EXP CLR.BY #177760 MOV     PSW,CC.EXP
2695  007770
2696  007770  042737  177760  000520  LET BFADRS := #BUFF1                BIC     #177760,CC.EXP
2697  007776
2698  007776  012737  061166  000540  CALL CLRBUF                          MOV     #BUFF1,BFADRS
2699  010004
2700  010004  004737  055346          LET TEMP0 := #BUFF1 + DATA02         JSR     PC,CLRBUF
2701  010010
2702  010010  012737  061166  000474                                       MOV     #BUFF1,TEMP0
2703  010016  063737  000564  000474                                       ADD     DATA02,TEMP0
2704  010024
2705  010024  113777  000562  170442  LET @TEMP0 :B- DATA01                MOVB    DATA01,@TEMP0
2706
2707                                  ;+
2708                                  ; DO THE CIS INSTRUCTION.
2709                                  ;-
2710
2711  010032                          INLINE  <LOCC>
```

```
2712  010032  076040                                                              LOCC
2713
2714                                  ;+
2715                                  ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
2716                                  ;-
2717
2718  010034                          LET CC := PSW
2719  010034  013737  177776  000516                                              MOV     PSW,CC
2720  010042                          LET CC := CC CLR.BY #177760
2721  010042  042737  177760  000516                                              BIC     #177760,CC
2722  010050                          IF CC NE CC.EXP THEN
2723  010050  023737  000516  000520                                              CMP     CC,CC.EXP
2724  010056  001402                                                              BEQ     $50310
2725  010060                              CALL ERROR
2726  010060  004737  056274                                                      JSR     PC,ERROR
2727  010064                          ENDIF
2728  010064                                                                $50310:
2729  010064                          IF R0 NE R0.EXP THEN
2730  010064  020037  000522                                                      CMP     R0,R0.EXP
2731  010070  001402                                                              BEQ     $50311
2732  010072                              CALL ERROR
2733  010072  004737  056274                                                      JSR     PC,ERROR
2734  010076                          ENDIF
2735  010076                                                                $50311:
2736  010076                          IF R1 NE R1.EXP THEN
2737  010076  020137  000524                                                      CMP     R1,R1.EXP
2738  010102  001402                                                              BEQ     $50312
2739  010104                              CALL ERROR
2740  010104  004737  056274                                                      JSR     PC,ERROR
2741  010110                          ENDIF
2742  010110                                                                $50312:
2743  010110                          IF R2 NE R2.EXP THEN
2744  010110  020237  000526                                                      CMP     R2,R2.EXP
2745  010114  001402                                                              BEQ     $50313
2746  010116                              CALL ERROR
2747  010116  004737  056274                                                      JSR     PC,ERROR
2748  010122                          ENDIF
2749  010122                                                                $50313:
2750  010122                          IF R3 NE R3.EXP THEN
2751  010122  020337  000530                                                      CMP     R3,R3.EXP
2752  010126  001402                                                              BEQ     $50314
2753  010130                              CALL ERROR
2754  010130  004737  056274                                                      JSR     PC,ERROR
2755  010134                          ENDIF
2756  010134                                                                $50314:
2757  010134                          IF R4 NE R4.EXP THEN
2758  010134  020437  000532                                                      CMP     R4,R4.EXP
2759  010140  001402                                                              BEQ     $50315
2760  010142                              CALL ERROR
2761  010142  004737  056274                                                      JSR     PC,ERROR
2762  010146                          ENDIF
2763  010146                                                                $50315:
2764  010146                          IF R5 NE R5.EXP THEN
2765  010146  020537  000534                                                      CMP     R5,R5.EXP
2766  010152  001402                                                              BEQ     $50316
2767  010154                              CALL ERROR
```

```
2768  010154  004737  056274                                                                  JSR     PC,ERROR
2769  010160                          ENDIF
2770  010160                                                                          $50316:
2771  010160                          LET TSTCAS := TSTCAS + #6
2772  010160  062737  000006  000542                                                ADD     #6,TSTCAS
2773  010166                          LET COUNT := COUNT - #1
2774  010166  005337  000466                                                       DEC     COUNT
2775                                  ;UNTIL COUNT EQ #0
2776  010172                          IF COUNT NE #0 THEN
2777  010172  005737  000466                                                       TST     COUNT
2778  010176  001402                                                               BEQ     $50317
2779  010200                              INLINE  <JMP        $5040>
2780  010200  000137  007564                                                       JMP     $5040
2781  010204                          ENDIF
2782  010204                                                                          $50317:
2783
2784
2785                                  ;+
2786                                  ; DO ONE INLINE CASE - LOCCI
2787                                  ;-
2788
2789  010204                          LET BFADRS := #BUFF1
2790  010204  012737  061166  000540                                                MOV     #BUFF1,BFADRS
2791  010212                          CALL SETBUF
2792  010212  004737  055410                                                       JSR     PC,SETBUF
2793  010216                          CALL CLRREG                     ;CLEAR R0 - R5
2794  010216  004737  055330                                                       JSR     PC,CLRREG
2795  010222                          LET TEMP0 := #BUFF1 + #25
2796  010222  012737  061166  000474                                                MOV     #BUFF1,TEMP0
2797  010230  062737  000025  000474                                                ADD     #25,TEMP0
2798  010236                          LET @TEMP0 :B= #40              ;SEARCH CHARACTER
2799  010236  112777  000040  170230                                                MOVB    #40,@TEMP0
2800  010244                          INLINE  <LOCCI>
2801  010244  076140                                                               LOCCI
2802  010246                          INLINE  <.WORD  TLOCCI>
2803  010246  010416                                                               .WORD   TLOCCI
2804  010250                          INLINE  <.WORD  40>
2805  010250  000040                                                               .WORD   40
2806  010252                          LET TEMP0 := PSW
2807  010252  013737  177776  000474                                                MOV     PSW,TEMP0
2808  010260                          INLINE  <BIT    #17,TEMP0>
2809  010260  032737  000017  000474                                                BIT     #17,TEMP0
2810  010266                          IFCOND NE THEN
2811  010266  001402                                                               BEQ     $50320
2812  010270                              CALL ERROR
2813  010270  004737  056274                                                       JSR     PC,ERROR
2814  010274                          ENDIF
2815  010274                                                                          $50320:
2816  010274                          LET TEMP0 := #BUFLEN-25
2817  010274  012737  000053  000474                                                MOV     #BUFLEN-25,TEMP0
2818  010302                          IF R0 NE TEMP0 THEN
2819  010302  020037  000474                                                       CMP     R0,TEMP0
2820  010306  001402                                                               BEQ     $50321
2821  010310                              CALL ERROR
2822  010310  004737  056274                                                       JSR     PC,ERROR
2823  010314                          ENDIF
```

```
 2824  010314                          
 2825  010314                          IF R1 NE #BUFF1+25 THEN
 2826  010314  020127  061213                                                  $50321:
 2827  010320  001402                                                                  CMP     R1,#BUFF1+25
 2828  010322                                  CALL ERROR                               BEQ     $50322
 2829  010322  004737  056274                                                          JSR     PC,ERROR
 2830  010326                          ENDIF
 2831  010326                                                                   $50322:
 2832  010326                          IF R2 NE #0 THEN
 2833  010326  005702                                                                  TST     R2
 2834  010330  001402                                                                  BEQ     $50323
 2835  010332                                  CALL ERROR
 2836  010332  004737  056274                                                          JSR     PC,ERROR
 2837  010336                          ENDIF
 2838  010336                                                                   $50323:
 2839  010336                          IF R3 NE #0 THEN
 2840  010336  005703                                                                  TST     R3
 2841  010340  001402                                                                  BEQ     $50324
 2842  010342                                  CALL ERROR
 2843  010342  004737  056274                                                          JSR     PC,ERROR
 2844  010346                          ENDIF
 2845  010346                                                                   $50324:
 2846  010346                          IF R4 NE #0 THEN
 2847  010346  005704                                                                  TST     R4
 2848  010350  001402                                                                  BEQ     $50325
 2849  010352                                  CALL ERROR
 2850  010352  004737  056274                                                          JSR     PC,ERROR
 2851  010356                          ENDIF
 2852  010356                                                                   $50325:
 2853  010356                          IF R5 NE #0 THEN
 2854  010356  005705                                                                  TST     R5
 2855  010360  001402                                                                  BEQ     $50326
 2856  010362                                  CALL ERROR
 2857  010362  004737  056274                                                          JSR     PC,ERROR
 2858  010366                          ENDIF
 2859  010366                                                                   $50326:
 2860  010366                          INLINE  <JMP    XSKPC>
 2861  010366  000137  010422                                                          JMP     XSKPC
 2862
 2863                                  ;+
 2864                                  ; TABLE OF TEST CASES FOR LOCC.
 2865                                  ;-
 2866
 2867  010372  000003                  TLOCC:  .WORD   3               ;# OF TEST CASES FOR LOCC
 2868
 2869  010374  000000                          .WORD   0                       ;SRC.LEN
 2870  010376  000101                          .WORD   101                     ;CHAR.SEARCHED FOR
 2871  010400  000041                          .WORD   41                      ;OFFSET
 2872
 2873  010402  000060                          .WORD   60              ;TEST CASE NUMBER 2
 2874  010404  000040                          .WORD   40
 2875  010406  000026                          .WORD   26
 2876
 2877  010410  000034                          .WORD   34              ;TEST CASE NUMBER 3
 2878  010412  000077                          .WORD   77
 2879  010414  000040                          .WORD   40
```

```
 2880
 2881
 2882  010416  000100                  TLOCCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
 2883  010420  061166                          .WORD   BUFF1
```

```
                                .SBTTL  SKPC
                                ;;*****************************************************************
                                ;
                                ;  SKPC TEST
                                ;
                                ;;*****************************************************************
010422                          INLINE  <XSKPC:>                                        XSKPC:
010422
010422                          INLINE  <SCOPE>                                         SCOPE
010422  000004
010424                          LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
010424  012737  000020  000404
010432                          LET COUNT := TSKPC              ;GET TEST COUNT         MOV     TSKPC,COUNT
010432  013737  011262  000466
010440                          LET TSTCAS := #TSKPC+2          ;POINT TO FIRST TEST CASE MOV   #TSKPC+2,TSTCAS
010440  012737  011264  000542
                                ;REPEAT
010446                          INLINE  <$5041:>                                        $5041:
010446
                                        ;+
                                        ; GET TEST DATA FROM TABLE
                                        ;-
010446                          LET R0 := TSTCAS                                        MOV     TSTCAS,R0
010446  013700  000542
010452                          LET DATA00 := (R0)+             ;SRC.LEN                MOV     (R0)+,DATA00
010452  012037  000560
010456                          LET DATA01 := (R0)+             ;NON-SEARCH CHAR        MOV     (R0)+,DATA01
010456  012037  000562
010462                          LET DATA02 := (R0)              ;OFFSET                 MOV     (R0),DATA02
010462  011037  000564
                                        ;+
                                        ; SET UP GPR'S
                                        ; EXPECTED GPR'S AND CONDITION CODES,
                                        ; AND SOURCE BUFFER.
                                        ;-
010466                          LET R0 := DATA00                                        MOV     DATA00,R0
010466  013700  000560
010472                          LET R1 := #BUFF1                                        MOV     #BUFF1,R1
010472  012701  061166
010476                          LET R4 := #377                                          MOV     #377,R4
010476  012704  000377
010502                          INLINE  <BIT    #BIT00,COUNT>                           BIT     #BIT00,COUNT
010502  032737  000001  000466
010510                          IFCOND EQ THEN                                          BNE     $50327
010510  001004
010512                             LET R2 := #0                                         CLR     R2
010512  005002
010514                             LET R3 := #0                                         CLR     R3
010514  005003
010516                             LET R5 := #0                                         CLR     R5
010516  005005
010520                          ELSE
```

```
2940  010520  000406                                                          BR      $50330
2941  010522                                                          $50327:
2942  010522                        LET R2 := #177777                         MOV     #177777,R2
2943  010522  012702  177777
2944  010526                        LET R3 := #177777                         MOV     #177777,R3
2945  010526  012703  177777
2946  010532                        LET R5 := #177777                         MOV     #177777,R5
2947  010532  012705  177777
2948  010536                    ENDIF
2949  010536                                                          $50330:
2950  010536                    IF DATA02 HI DATA00 THEN                      CMP     DATA02,DATA00
2951  010536  023737  000564  000560                                          BLOS    $50331
2952  010544  101411
2953  010546                        LET R0.EXP := #0                          CLR     R0.EXP
2954  010546  005037  000522
2955  010552                        LET R1.EXP := #BUFF1 + DATA00             MOV     #BUFF1,R1.EXP
2956  010552  012737  061166  000524                                          ADD     DATA00,R1.EXP
2957  010560  063737  000560  000524
2958  010566                    ELSE                                          BR      $50332
2959  010566  000414                                                 $50331:
2960  010570                        LET R0.EXP := DATA00 - DATA02             MOV     DATA00,R0.EXP
2961  010570                                                                  SUB     DATA02,R0.EXP
2962  010570  013737  000560  000522
2963  010576  163737  000564  000522        LET R1.EXP := #BUFF1 + DATA02     MOV     #BUFF1,R1.EXP
2964  010604                                                                  ADD     DATA02,R1.EXP
2965  010604  012737  061166  000524
2966  010612  063737  000564  000524    ENDIF
2967  010620                                                          $50332:
2968  010620
2969  010620    LET R2.EXP := R2                                              MOV     R2,R2.EXP
2970  010620  010237  000526
2971  010624    LET R3.EXP := R3                                              MOV     R3,R3.EXP
2972  010624  010337  000530
2973  010630    LET R4.EXP := R4                                              MOV     R4,R4.EXP
2974  010630  010437  000532
2975  010634    LET R5.EXP := R5                                              MOV     R5,R5.EXP
2976  010634  010537  000534
2977  010640    INLINE  <TST    R0.EXP>                                       TST     R0.EXP
2978  010640  005737  000522
2979  010644    LET CC.EXP := PSW                                             MOV     PSW,CC.EXP
2980  010644  013737  177776  000520
2981  010652    LET CC.EXP := CC.EXP CLR.BY #177760                           BIC     #177760,CC.EXP
2982  010652  042737  177760  000520
2983  010660    LET BFADRS := #BUFF1                                          MOV     #BUFF1,BFADRS
2984  010660  012737  061166  000540
2985  010666    CALL SETBUF             ;FILL BUFFER WITH SEARCH CHAR         JSR     PC,SETBUF
2986  010666  004737  055410
2987  010672    LET TEMP0 := #BUFF1 + DATA02                                  MOV     #BUFF1,TEMP0
2988  010672  012737  061166  000474                                          ADD     DATA02,TEMP0
2989  010700  063737  000564  000474
2990  010706    LET @TEMP0 :B= DATA01                                         MOVB    DATA01,@TEMP0
2991  010706  113777  000562  167560
2992
2993              ;+
2994              ; DO THE CIS INSTRUCTION
2995              ;-
```

```
                                        INLINE  <SKPC>
010714
010714  076041                                                          SKPC

                                        ;+
                                        ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
                                        ;-

010716                                  LET CC := PSW
010716  013737  177776  000516                                          MOV     PSW,CC
010724                                  LET CC := CC CLR.BY #177760
010724  042737  177760  000516                                          BIC     #177760,CC
010732                                  IF CC NE CC.EXP THEN
010732  023737  000516  000520                                          CMP     CC,CC.EXP
010740  001402                                                          BEQ     $50333
010742                                      CALL ERROR
010742  004737  056274                                                  JSR     PC,ERROR
010746                                  ENDIF
010746                                                          $50333:
010746                                  IF R0 NE R0.EXP THEN
010746  020037  000522                                                  CMP     R0,R0.EXP
010752  001402                                                          BEQ     $50334
010754                                      CALL ERROR
010754  004737  056274                                                  JSR     PC,ERROR
010760                                  ENDIF
010760                                                          $50334:
010760                                  IF R1 NE R1.EXP THEN
010760  020137  000524                                                  CMP     R1,R1.EXP
010764  001402                                                          BEQ     $50335
010766                                      CALL ERROR
010766  004737  056274                                                  JSR     PC,ERROR
010772                                  ENDIF
010772                                                          $50335:
010772                                  IF R2 NE R2.EXP THEN
010772  020237  000526                                                  CMP     R2,R2.EXP
010776  001402                                                          BEQ     $50336
011000                                      CALL ERROR
011000  004737  056274                                                  JSR     PC,ERROR
011004                                  ENDIF
011004                                                          $50336:
011004                                  IF R3 NE R3.EXP THEN
011004  020337  000530                                                  CMP     R3,R3.EXP
011010  001402                                                          BEQ     $50337
011012                                      CALL ERROR
011012  004737  056274                                                  JSR     PC,ERROR
011016                                  ENDIF
011016                                                          $50337:
011016                                  IF R4 NE R4.EXP THEN
011016  020437  000532                                                  CMP     R4,R4.EXP
011022  001402                                                          BEQ     $50340
011024                                      CALL ERROR
011024  004737  056274                                                  JSR     PC,ERROR
011030                                  ENDIF
011030                                                          $50340:
011030                                  IF R5 NE R5.EXP THEN
011030  020537  000534                                                  CMP     R5,R5.EXP
```

```
3052  011034  001402                                                          BEQ     $50341
3053  011036                          CALL ERROR
3054  011036  004737  056274                                                  JSR     PC,ERROR
3055  011042                      ENDIF
3056  011042                                                          $50341:
3057  011042                      LET TSTCAS := TSTCAS + #6
3058  011042  062737  000006  000542                                          ADD     #6,TSTCAS
3059  011050                      LET COUNT := COUNT - #1
3060  011050  005337  000466                                                  DEC     COUNT
3061                          ;UNTIL COUNT EQ #0
3062  011054                  IF COUNT NE #0 THEN
3063  011054  005737  000466                                                  TST     COUNT
3064  011060  001402                                                          BEQ     $50342
3065  011062                      INLINE  <JMP        $5041>
3066  011062  000137  010446                                                  JMP     $5041
3067  011066                  ENDIF
3068  011066                                                          $50342:
3069
3070
3071                          ;+
3072                          ;DO ONE INLINE CASE - SKPCI
3073                          ;-
3074
3075  011066                  LET BFADRS := #BUFF1
3076  011066  012737  061166  000540                                          MOV     #BUFF1,BFADRS
3077  011074                  CALL SETBUF
3078  011074  004737  055410                                                  JSR     PC,SETBUF
3079  011100                  CALL CLRREG
3080  011100  004737  055330                                                  JSR     PC,CLRREG
3081  011104                  LET TEMP0 := #BUFF1 + #25
3082  011104  012737  061166  000474                                          MOV     #BUFF1,TEMP0
3083  011112  062737  000025  000474                                          ADD     #25,TEMP0
3084  011120                  LET @TEMP0 :B= #40
3085  011120  112777  000040  167346                                          MOVB    #40,@TEMP0
3086  011126                  INLINE  <SKPCI>
3087  011126  076141                                                          SKPCI
3088  011130                  INLINE  <.WORD  TSKPCI>
3089  011130  011300                                                          .WORD   TSKPCI
3090  011132                  INLINE  <.WORD  377>
3091  011132  000377                                                          .WORD   377
3092  011134                  LET TEMP0 := PSW
3093  011134  013737  177776  000474                                          MOV     PSW,TEMP0
3094  011142                  INLINE  <BIT    #17,TEMP0>
3095  011142  032737  000017  000474                                          BIT     #17,TEMP0
3096  011150                  IFCOND NE THEN
3097  011150  001402                                                          BEQ     $50343
3098  011152                      CALL ERROR
3099  011152  004737  056274                                                  JSR     PC,ERROR
3100  011156                  ENDIF
3101  011156                                                          $50343:
3102  011156                  LET TEMP0 :  #BUFLEN - #25
3103  011156  012737  000100  000474                                          MOV     #BUFLEN,TEMP0
3104  011164  162737  000025  000474                                          SUB     #25,TEMP0
3105  011172                  IF R0 NE TEMP0 THEN
3106  011172  020037  000474                                                  CMP     R0,TEMP0
3107  011176  001402                                                          BEQ     $50344
```

```
3108  011200
3109  011200  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3110  011204                                  ENDIF
3111  011204                                                                              $50344:
3112  011204                                  IF R1 NE #BUFF1+25 THEN
3113  011204  020127  061213                                                              CMP     R1,#BUFF1+25
3114  011210  001402                                                                      BEQ     $50345
3115  011212
3116  011212  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3117  011216                                  ENDIF
3118  011216                                                                              $50345:
3119  011216                                  IF R2 NE #0 THEN
3120  011216  005702                                                                      TST     R2
3121  011220  001402                                                                      BEQ     $50346
3122  011222
3123  011222  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3124  011226                                  ENDIF
3125  011226                                                                              $50346:
3126  011226                                  IF R3 NE #0 THEN
3127  011226  005703                                                                      TST     R3
3128  011230  001402                                                                      BEQ     $50347
3129  011232
3130  011232  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3131  011236                                  ENDIF
3132  011236                                                                              $50347:
3133  011236                                  IF R4 NE #0 THEN
3134  011236  005704                                                                      TST     R4
3135  011240  001402                                                                      BEQ     $50350
3136  011242
3137  011242  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3138  011246                                  ENDIF
3139  011246                                                                              $50350:
3140  011246                                  IF R5 NE #0 THEN
3141  011246  005705                                                                      TST     R5
3142  011250  001402                                                                      BEQ     $50351
3143  011252
3144  011252  004737  056274                    CALL ERROR                                  JSR     PC,ERROR
3145  011256                                  ENDIF
3146  011256                                                                              $50351:
3147  011256                                  INLINE   <JMP   XSCANC>
3148  011256  000137  011304                                                              JMP     XSCANC
3149
3150                                          ;+
3151                                          ; TABLE OF TEST CASES FOR SKPC.
3152                                          ;-
3153
3154  011262  000002                          TSKPC:  .WORD   2               ;# OF TEST CASES FOR SKPC
3155
3156  011264  000040                                  .WORD   40                      ;SRC.LEN
3157  011266  000100                                  .WORD   100                     ;NON-SEARCH CHAR.
3158  011270  000060                                  .WORD   60                      ;OFFSET
3159
3160  011272  000050                                  .WORD   50              ;TEST CASE NUMBER 2
3161  011274  000077                                  .WORD   77
3162  011276  000030                                  .WORD   30
3163
```

```
 3164
 3165  011300  000100                  TSKPCI: .WORD   BJFLEN          ;TEST CASE FOR INLINE
 3166  011302  061166                          .WORD   BUFF1
 3167
```

```
                        .SBTTL  SCANC
                        ;;*****************************************************************
                        ;
                        ;  SCANC TEST
                        ;
                        ;;*****************************************************************
011304                  INLINE  <XSCANC:>                                       XSCANC:
011304                  INLINE  <SCOPE>                                         SCOPE
011304  000004          LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
011306  012737  000020  000404
011314  013737  012230  000466  LET COUNT := TSCANC      ;GET TEST COUNT         MOV     TSCANC,COUNT
011322  012737  012232  000542  LET TSTCAS := #TSCANC+2  ;POINT TO FIRST TEST CASE MOV    #TSCANC+2,TSTCAS
                        ;REPEAT
011330                  INLINE  <$5042:>                                        $5042:
                                ;+
                                ; GET TEST DATA FROM TABLE
                                ;-
011330                          LET R0 := TSTCAS                                MOV     TSTCAS,R0
011330  013700  000542
011334                          LET DATA00 := (R0)+     ;SRC.LEN                MOV     (R0)+,DATA00
011334  012037  000560
011340                          LET DATA01 := (R0)      ;OFFSET                 MOV     (R0),DATA01
011340  011037  000562
                                ;+
                                ; SET UP GPR'S,
                                ; EXPECTED GPR'S AND CONDITION CODES
                                ; SOURCE BUFFER, AND CHARACTER SET TABLE.
                                ;-
011344                          LET R0 := DATA00                                MOV     DATA00,R0
011344  013700  000560
011350                          LET R1 := #BUFF1                                MOV     #BUFF1,R1
011350  012701  061166
011354                          LET R4 := #1            ;MASK                   MOV     #1,R4
011354  012704  000001
011360                          LET R5 := #CHRSET                               MOV     #CHRSET,R5
011360  012705  061766
011364                  INLINE  <BIT    #BIT00,COUNT>                           BIT     #BIT00,COUNT
011364  032737  000001  000466
011372                  IFCOND EQ THEN                                          BNE     $50352
011372  001003
011374                      LET R2 := #0                                        CLR     R2
011374  005002
011376                      LET R3 := #0                                        CLR     R3
011376  005003
011400                  ELSE                                                    BR      $50353
011400  000404
011402                                                                  $50352:
```

```
3224  011402
3225  011402  012702  177777                    LET R2 := #177777                          MOV     #177777,R2
3226  011406
3227  011406  012703  177777                    LET R3 := #177777                          MOV     #177777,R3
3228  011412                                  ENDIF
3229  011412                                                                          $50353:
3230  011412                                  IF DATA01 HI DATA00 THEN
3231  011412  023737  000562  000560                                                 CMP     DATA01,DATA00
3232  011420  101411                                                                 BLOS    $50354
3233  011422
3234  011422  005037  000522                    LET R0.EXP := #0                           CLR     R0.EXP
3235  011426
3236  011426  012737  061166  000524            LET R1.EXP := #BUFF1 + DATA00              MOV     #BUFF1,R1.EXP
3237  011434  063737  000560  000524                                                     ADD     DATA00,R1.EXP
3238  011442
3239  011442  000414                                                                 BR      $50355
3240  011444                                  ELSE                                   $50354:
3241  011444
3242  011444  013737  000560  000522            LET R0.EXP := DATA00 - DATA01               MOV     DATA00,R0.EXP
3243  011452  163737  000562  000522                                                     SUB     DATA01,R0.EXP
3244  011460
3245  011460  012737  061166  000524            LET R1.EXP := #BUFF1 + DATA01              MOV     #BUFF1,R1.EXP
3246  011466  063737  000562  000524                                                     ADD     DATA01,R1.EXP
3247  011474                                  ENDIF
3248  011474                                                                          $50355:
3249  011474
3250  011474  010237  000526                    LET R2.EXP := R2                           MOV     R2,R2.EXP
3251  011500
3252  011500  010337  000530                    LET R3.EXP := R3                           MOV     R3,R3.EXP
3253  011504
3254  011504  010437  000532                    LET R4.EXP := R4                           MOV     R4,R4.EXP
3255  011510
3256  011510  010537  000534                    LET R5.EXP := R5                           MOV     R5,R5.EXP
3257  011514
3258  011514  005737  000522                    INLINE  <TST   R0.EXP>                     TST   R0.EXP
3259  011520
3260  011520  013737  177776  000520            LET CC.EXP := PSW                          MOV     PSW,CC.EXP
3261  011526
3262  011526  042737  177760  000520            LET CC.EXP := CC.EXP CLR.BY #177760        BIC     #177760,CC.EXP
3263  011534
3264  011534  012737  061166  000540            LET BFADRS := #BUFF1                       MOV     #BUFF1,BFADRS
3265  011542
3266  011542  004737  055346                    CALL CLRBUF                                JSR     PC,CLRBUF
3267  011546
3268  011546  012737  061166  000474            LET TEMP0 := #BUFF1 + DATA01               MOV     #BUFF1,TEMP0
3269  011554  063737  000562  000474                                                     ADD     DATA01,TEMP0
3270  011562
3271  011562  112777  000125  166704            LET @TEMP0 :B= #125                        MOVB    #125,@TEMP0
3272  011570                                  WHILE R5 LO #CHRSET+400 DO                                 $50356:
3273  011570
3274  011570  020527  062366                                                         CMP     R5,#CHRSET+400
3275  011574  103002                                                                 BHIS    $50357
3276  011576
3277  011576  005025                             INLINE  <CLR (R5)+>                CLR     (R5)+
3278  011600                                  ENDDO                                  BR      $50356
3279  011600  000773
```

```
3280  011602                                                                          $50357:
3281  011602                        LET R5 := #CHRSET                         ;RESTORE R5
3282  011602  012705  061766                                                          MOV     #CHRSET,R5
3283  011606                        LET TEMP0 := #CHRSET + #125
3284  011606  012737  061766  000474                                                 MOV     #CHRSET,TEMP0
3285  011614  062737  000125  000474                                                 ADD     #125,TEMP0
3286  011622                        LET @TEMP0 :B= #1                         ;SET MASK IN CHAR SET TABLE
3287  011622  112777  000001  166644                                                 MOVB    #1,@TEMP0
3288
3289                                :+
3290                                ; DO THE CIS INSTRUCTION
3291                                :-
3292
3293  011630                        INLINE  <SCANC>
3294  011630  076042                                                                 SCANC
3295
3296                                :+
3297                                ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
3298                                :-
3299
3300  011632                        LET CC := PSW
3301  011632  013737  177776  000516                                                 MOV     PSW,CC
3302  011640                        LET CC := CC CLR.BY #177760
3303  011640  042737  177760  000516                                                 BIC     #177760,CC
3304  011646                        IF CC NE CC.EXP THEN
3305  011646  023737  000516  000520                                                 CMP     CC,CC.EXP
3306  011654  001402                                                                 BEQ     $50360
3307  011656
3308  011656  004737  056274                                                        JSR     PC,ERROR
3309  011662                            CALL ERROR
3310  011662                        ENDIF                                     $50360:
3311  011662
3312  011662  020037  000522       IF R0 NE R0.EXP THEN                              CMP     R0,R0.EXP
3313  011666  001402                                                                 BEQ     $50361
3314  011670
3315  011670  004737  056274           CALL ERROR                                   JSR     PC,ERROR
3316  011674                        ENDIF                                     $50361:
3317  011674
3318  011674                        IF R1 NE R1.EXP THEN
3319  011674  020137  000524                                                         CMP     R1,R1.EXP
3320  011700  001402                                                                 BEQ     $50362
3321  011702
3322  011702  004737  056274           CALL ERROR                                   JSR     PC,ERROR
3323  011706                        ENDIF                                     $50362:
3324  011706
3325  011706                        IF R2 NE R2.EXP THEN
3326  011706  020237  000526                                                         CMP     R2,R2.EXP
3327  011712  001402                                                                 BEQ     $50363
3328  011714
3329  011714  004737  056274           CALL ERROR                                   JSR     PC,ERROR
3330  011720                        ENDIF                                     $50363:
3331  011720
3332  011720                        IF R3 NE R3.EXP THEN
3333  011720  020337  000530                                                         CMP     R3,R3.EXP
3334  011724  001402                                                                 BEQ     $50364
3335  011726                            CALL ERROR
```

```
3336  011726  004737  056274                    ENDIF                                                    JSR     PC,ERROR
3337  011732
3338  011732                                                                                           $50364:
3339  011732                                    IF R4 NE R4.EXP THEN
3340  011732  020437  000532                                                                           CMP     R4,R4.EXP
3341  011736  001402                                                                                   BEQ     $50365
3342  011740                                        CALL ERROR
3343  011740  004737  056274                                                                           JSR     PC,ERROR
3344  011744                                    ENDIF
3345  011744                                                                                           $50365:
3346  011744                                    IF R5 NE R5.EXP THEN
3347  011744  020537  000534                                                                           CMP     R5,R5.EXP
3348  011750  001402                                                                                   BEQ     $50366
3349  011752                                        CALL ERROR
3350  011752  004737  056274                                                                           JSR     PC,ERROR
3351  011756                                    ENDIF
3352  011756                                                                                           $50366:
3353  011756                                    LET TSTCAS := TSTCAS + #4
3354  011756  062737  000004  000542                                                                   ADD     #4,TSTCAS
3355  011764                                    LET COUNT := COUNT - #1
3356  011764  005337  000466                                                                           DEC     COUNT
3357                                        ;UNTIL COUNT EQ #0
3358  011770                                IF COUNT NE #0 THEN
3359  011770  005737  000466                                                                           TST     COUNT
3360  011774  001402                                                                                   BEQ     $50367
3361  011776                                    INLINE  <JMP        $5042>
3362  011776  000137  011330                                                                           JMP     $5042
3363  012002                                ENDIF
3364  012002                                                                                           $50367:
3365
3366
3367                                        ;+
3368                                        ; DO ONE INLINE CASE - SCANCI.
3369                                        ;-
3370
3371  012002                                LET BFADRS := #BUFF1
3372  012002  012737  061166  000540                                                                   MOV     #BUFF1,BFADRS
3373  012010                                CALL CLRBUF
3374  012010  004737  055346                                                                           JSR     PC,CLRBUF
3375  012014                                LET TEMP0 := #BUFF1 + #50
3376  012014  012737  061166  000474                                                                   MOV     #BUFF1,TEMP0
3377  012022  062737  000050  000474                                                                   ADD     #50,TEMP0
3378  012030                                LET @TEMP0 :B= #27
3379  012030  112777  000027  166436                                                                   MOVB    #27,@TEMP0
3380  012036                                LET R0 := #CHRSET
3381  012036  012700  061766                                                                           MOV     #CHRSET,R0
3382  012042                                WHILE R0 LO #CHRSET+400 DO
3383  012042                                                                                           $50370:
3384  012042  020027  062366                                                                           CMP     R0,#CHRSET+400
3385  012046  103002                                                                                   BHIS    $50371
3386  012050                                    INLINE  <CLR        (R0)+>          ;CLEAR CHAR.SET TABLE
3387  012050  005020                                                                                   CLR     (R0)+
3388  012052                                ENDDO
3389  012052  000773                                                                                   BR      $50370
3390  012054                                                                                           $50371:
3391  012054                                LET TEMP0 :- #CHRSET + #27
```

```
3392  012054  012737  061766  000474                                                  MOV     #CHRSET,TEMP0
3393  012062  062737  000027  000474                                                  ADD     #27,TEMP0
3394  012070                                LET @TEMP0 :B= #10                ;SET MASK IN CHAR SET TABLE
3395  012070  112777  000010  16636                                                  MOVB    #10,@TEMP0
3396  012076                                CALL CLRREG
3397  012076  004737  055330                                                        JSR     PC,CLRREG
3398  012102                                INLINE  <SCANCI>
3399  012102  076142                                                                SCANCI
3400  012104                                INLINE  <.WORD  TSCNCI>
3401  012104  012246                                                                .WORD   TSCNCI
3402  012106                                INLINE  <.WORD  TSCNCI+4>
3403  012106  012252                                                                .WORD   TSCNCI+4
3404  012110                                LET TEMP0 := PSW
3405  012110  013737  177776  000474                                                MOV     PSW,TEMP0
3406  012116                                INLINE  <BIT    #17,TEMP0>
3407  012116  032737  000017  000474                                                BIT     #17,TEMP0
3408  012124                                IFCOND NE THEN
3409  012124  001402                                                                BEQ     $50372
3410  012126                                        CALL ERROR
3411  012126  004737  056274                                                        JSR     PC,ERROR
3412  012132                                ENDIF
3413  012132                                                                $50372:
3414  012132                                LET TEMP0 := #BUFLEN-50
3415  012132  012737  000030  000474                                                MOV     #BUFLEN-50,TEMP0
3416  012140                                IF R0 NE TEMP0 THEN
3417  012140  020037  000474                                                        CMP     R0,TEMP0
3418  012144  001402                                                                BEQ     $50373
3419  012146                                        CALL ERROR
3420  012146  004737  056274                                                        JSR     PC,ERROR
3421  012152                                ENDIF
3422  012152                                                                $50373:
3423  012152                                IF R1 NE #BUFF1+50 THEN
3424  012152  020127  061236                                                        CMP     R1,#BUFF1+50
3425  012156  001402                                                                BEQ     $50374
3426  012160                                        CALL ERROR
3427  012160  004737  056274                                                        JSR     PC,ERROR
3428  012164                                ENDIF
3429  012164                                                                $50374:
3430  012164                                IF R2 NE #0 THEN
3431  012164  005702                                                                TST     R2
3432  012166  001402                                                                BEQ     $50375
3433  012170                                        CALL ERROR
3434  012170  004737  056274                                                        JSR     PC,ERROR
3435  012174                                ENDIF
3436  012174                                                                $50375:
3437  012174                                IF R3 NE #0 THEN
3438  012174  005703                                                                TST     R3
3439  012176  001402                                                                BEQ     $50376
3440  012200                                        CALL ERROR
3441  012200  004737  056274                                                        JSR     PC,ERROR
3442  012204                                ENDIF
3443  012204                                                                $50376:
3444  012204                                IF R4 NE #0 THEN
3445  012204  005704                                                                ST      R4
3446  012206  001402                                                                BEQ     $50377
3447  012210                                        CALL ERROR
```

```
3448  012210  004737  056274                                                  JSR     PC,ERROR
3449  012214                      ENDIF
3450  012214                                                          $50377:
3451  012214                      IF R5 NE #0 THEN
3452  012214  005705                                                         TST     R5
3453  012216  001402                                                         BEQ     $50400
3454  012220                              CALL ERROR
3455  012220  004737  056274                                                JSR     PC,ERROR
3456  012224                      ENDIF
3457  012224                                                          $50400:
3458  012224                      INLINE  <JMP    XSPANC>
3459  012224  000137  01225e                                                JMP     XSPANC
3460
3461                              ;+
3462                              ; TABLE OF TEST CASES FOR SCANC.
3463                              ;-
3464
3465  012230  000003              TSCANC: .WORD   3               ;#OF TEST CASES FOR SCANC
3466
3467  012232  000000                      .WORD   0                       ;SRC.LEN
3468  012234  000020                      .WORD   20                      ;OFFSET
3469
3470  012236  000100                      .WORD   BUFLEN          ;TEST CASE NUMBER 2
3471  012240  000030                      .WORD   30
3472
3473  012242  000100                      .WORD   BUFLEN          ;TEST CASE NUMBER 3
3474  012244  000110                      .WORD   BUFLEN+10
3475
3476
3477  012246  000100              TSCNCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
3478  012250  061166                      .WORD   BUFF1
3479  012252  000010                      .WORD   10
3480  012254  061766                      .WORD   CHRSET
```

```
                                        .SBTTL  SPANC
                                        ;;*****************************************************************
                                        ;
                                        ;  SPANC TEST
                                        ;
                                        ;;*****************************************************************
012256                                  INLINE  <XSPANC:>                                       XSPANC:
012256                                  INLINE  <SCOPE>                                         SCOPE
012256  000004                          LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
012260  012737  000020  000404          LET COUNT := TSPANC             ;GET TEST COUNT         MOV     TSPANC,COUNT
012266  013737  013152  000466          LET TSTCAS := #TSPANC+2         ;POINT TO FIRST TEST CASE
012274                                                                                          MOV     #TSPANC+2,TSTCAS
012274  012737  013154  000542          ;REPEAT
012302                                  INLINE  <$5043:>                                        $5043:
012302
                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-
012302
012302  013700  000542                          LET R0 := TSTCAS                                MOV     TSTCAS,R0
012306                                          LET DATA00 := (R0)+             ;SRC.LEN
012306  012037  000560                                                                          MOV     (R0)+,DATA00
012312                                          LET DATA01 := (R0)              ;OFFSET
012312  011037  000562                                                                          MOV     (R0),DATA01
                                                ;+
                                                ; SET UP GPR'S,
                                                ; EXPECTED GPR'S AND CONDITION CODES,
                                                ; SOURCE BUFFER, AND CHARACTER SET TABLE.
                                                ;-
012316
012316  013700  000560                          LET R0 := DATA00                                MOV     DATA00,R0
012322                                          LET R1 := #BUFF1                                MOV     #BUFF1,R1
012322  012701  061166                                                                          MOV     #40,R4
012326                                          LET R4 := #40                   ;MASK           MOV     #CHRSET,R5
012326  012704  000040                          LET R5 := #CHRSET                               BIT     #BIT00,COUNT
012332                                          INLINE  <BIT    #BIT00,COUNT>                   BNE     $50401
012332  012705  061766                          IFCOND EQ THEN                                  CLR     R2
012336                                              LET R2 := #0                                CLR     R3
012336  032737  000001  000466                      LET R3 := #0                                BR      $50402
012344                                          ELSE                                    $50401:
012344  001003
012346
012346  005002
012350
012350  005003
012352
012352  000404
012354
```

```
3537  012354
3538  012354  012702  177777                    LET R2 := #177777                                  MOV     #177777,R2
3539  012360
3540  012360  012703  177777                    LET R3 := #177777                                  MOV     #177777,R3
3541  012364                                  ENDIF
3542  012364                                                                                  $50402:
3543  012364                                  IF DATA01 HI DATA00 THEN
3544  012364  023737  000562  000560                                                             CMP     DATA01,DATA00
3545  012372  101411                                                                             BLOS    $50403
3546  012374
3547  012374  005037  000522                      LET R0.EXP := #0                               CLR     R0.EXP
3548  012400
3549  012400  012737  061166  000524              LET R1.EXP := #BUFF1 + DATA00                  MOV     #BUFF1,R1.EXP
3550  012406  063737  000560  000524                                                             ADD     DATA00,R1.EXP
3551  012414                                  ELSE
3552  012414  000414                                                                             BR      $50404
3553  012416                                                                                  $50403:
3554  012416
3555  012416  013737  000560  000522              LET R0.EXP := DATA00 - DATA01                  MOV     DATA00,R0.EXP
3556  012424  163737  000562  000522                                                             SUB     DATA01,R0.EXP
3557  012432
3558  012432  012737  061166  000524              LET R1.EXP := #BUFF1 + DATA01                  MOV     #BUFF1,R1.EXP
3559  012440  063737  000562  000524                                                             ADD     DATA01,R1.EXP
3560  012446                                  ENDIF
3561  012446                                                                                  $50404:
3562  012446
3563  012446  010237  000526                      LET R2.EXP := R2                               MOV     R2,R2.EXP
3564  012452
3565  012452  010337  000530                      LET R3.EXP := R3                               MOV     R3,R3.EXP
3566  012456
3567  012456  010437  000532                      LET R4.EXP := R4                               MOV     R4,R4.EXP
3568  012462
3569  012462  010537  000534                      LET R5.EXP := R5                               MOV     R5,R5.EXP
3570  012466                                  INLINE  <TST    R0.EXP>
3571  012466  005737  000522                      LET CC.EXP := PSW                              TST     R0.EXP
3572  012472                                                                                      MOV     PSW,CC.EXP
3573  012472  013737  177776  000520              LET CC.EXP := CC.EXP CLR.BY #177760            BIC     #177760,CC.EXP
3574  012500
3575  012500  042737  177760  000520              LET BFADRS := #BUFF1                           MOV     #BUFF1,BFADRS
3576  012506                                      CALL CLRBUF                                    JSR     PC,CLRBUF
3577  012506  012737  061166  000540              LET TEMP0 := #BUFF1 + DATA01                   MOV     #BUFF1,TEMP0
3578  012514                                                                                      ADD     DATA01,TEMP0
3579  012514  004737  055346
3580  012520                                      LET @TEMP0 :B= #252                            MOVB    #252,@TEMP0
3581  012520  012737  061166  000474              WHILE R5 LO #CHRSET+400 DO
3582  012526  063737  000562  000474                                                          $50405:
3583  012534                                                                                      CMP     R5,#CHRSET+400
3584  012534  112777  000252  165732                  INLINE  <CLR        (R5)+>      ;CLEAR CHAR. SET TABLE  BHIS    $50406
3585  012542                                      ENDDO                                          CLR     (R5)+
3586  012542                                                                                      BR      $50405
3587  012542  020527  062366
3588  012546  103002
3589  012550
3590  012550  005025
3591  012552
3592  012552  000773
```

```
3593  012554                                                                          $50406:
3594  012554                          LET R5 := #CHRSET               ;RESTORE R5
3595  012554  012705  061766                                                         MOV     #CHRSET,R5
3596  012560                          LET CHRSET :B= #40              ;SET MASK IN CHAR. SET
3597  012560  112737  000040  061766                                                 MOVB    #40,CHRSET
3598
3599                                  ;+
3600                                  ; DO THE CIS INSTRUCTION
3601                                  ;-
3602
3603  012566                          INLINE  <SPANC>
3604  012566  076043                                                                 SPANC
3605
3606                                  ;+
3607                                  ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
3608                                  ;-
3609
3610  012570                          LET CC := PSW
3611  012570  013737  177776  000516                                                 MOV     PSW,CC
3612  012576                          LET CC := CC CLR.BY #177760
3613  012576  042737  177760  000516                                                 BIC     #177760,CC
3614  012604                          IF CC NE CC.EXP THEN
3615  012604  023737  000516  000520                                                 CMP     CC,CC.EXP
3616  012612  001402                                                                 BEQ     $50407
3617  012614                              CALL ERROR
3618  012614  004737  056274                                                         JSR     PC,ERROR
3619  012620                          ENDIF
3620  012620                                                                  $50407:
3621  012620                          IF R0 NE R0.EXP THEN
3622  012620  020037  000522                                                         CMP     R0,R0.EXP
3623  012624  001402                                                                 BEQ     $50410
3624  012626                              CALL ERROR
3625  012626  004737  056274                                                         JSR     PC,ERROR
3626  012632                          ENDIF
3627  012632                                                                  $50410:
3628  012632                          IF R1 NE R1.EXP THEN
3629  012632  020137  000524                                                         CMP     R1,R1.EXP
3630  012636  001402                                                                 BEQ     $50411
3631  012640                              CALL ERROR
3632  012640  004737  056274                                                         JSR     PC,ERROR
3633  012644                          ENDIF
3634  012644                                                                  $50411:
3635  012644                          IF R2 NE R2.EXP THEN
3636  012644  020237  000526                                                         CMP     R2,R2.EXP
3637  012650  001402                                                                 BEQ     $50412
3638  012652                              CALL ERROR
3639  012652  004737  056274                                                         JSR     PC,ERROR
3640  012656                          ENDIF
3641  012656                                                                  $50412:
3642  012656                          IF R3 NE R3.EXP THEN
3643  012656  020337  000530                                                         CMP     R3,R3.EXP
3644  012662  001402                                                                 BEQ     $50413
3645  012664                              CALL ERROR
3646  012664  004737  056274                                                         JSR     PC,ERROR
3647  012670                          ENDIF
3648  012670                                                                  $50413:
```

```
3649  012670                                  IF R4 NE R4.EXP THEN                                    CMP     R4,R4.EXP
3650  012670  020437  000532                                                                          BEQ     $50414
3651  012674  001402
3652  012676                                      CALL ERROR                                          JSR     PC,ERROR
3653  012676  004737  056274
3654  012702                                  ENDIF                                           $50414:
3655  012702                                  IF R5 NE R5.EXP THEN                                    CMP     R5,R5.EXP
3656  012702                                                                                          BEQ     $50415
3657  012702  020537  000534
3658  012706  001402                              CALL ERROR                                          JSR     PC,ERROR
3659  012710
3660  012710  004737  056274                  ENDIF                                           $50415:
3661  012714                                  LET TSTCAS := TSTCAS + #4                               ADD     #4,TSTCAS
3662  012714
3663  012714                                  LET COUNT := COUNT - #1                                 DEC     COUNT
3664  012714  062737  000004  000542
3665  012722                                ;UNTIL COUNT EQ #0                                        TST     COUNT
3666  012722  005337  000466               IF COUNT NE #0 THEN                                     BEQ     $50416
3667                                                                                                  JMP     $5043
3668  012726                                      INLINE  <JMP    $5043>                      $50416:
3669  012726  005737  000466
3670  012732  001402                       ENDIF
3671  012734
3672  012734  000137  012302
3673  012740                                ;+
3674  012740                                ; DO ONE INLINE CASE - SPANCI
3675                                        ;-
3676
3677                                        LET BFADRS := #BUFF1                                    MOV     #BUFF1,BFADRS
3678                                        CALL CLRBUF                                             JSR     PC,CLRBUF
3679                                        LET TEMP0 := #BUFF1 + #50                               MOV     #BUFF1,TEMP0
3680                                                                                                ADD     #50,TEMP0
3681  012740                                LET @TEMP0 :B= #27                                      MOVB    #27,@TEMP0
3682  012740  012737  061166  000540        LET R0 := #CHRSET                                       MOV     #CHRSET,R0
3683  012746                                WHILE R0 LO #CHRSET+400 DO                      $50417:
3684  012746  004737  055346                                                                         CMP     R0,#CHRSET+400
3685  012752                                                                                          BHIS    $50420
3686  012752  012737  061166  000474                LET (R0)+ := #0         ;CLEAR CHAR. SET TABLE  CLR     (R0)+
3687  012760  062737  000050  000474        ENDDO                                                   BR      $50417
3688  012766                                                                                  $50420:
3689  012766  112777  000027  165500        CALL CLRREG                                             JSR     PC,CLRREG
3690  012774                                LET CHRSET :B- #10                                      MOVB    #10,CHRSET
3691  012774  012700  061766
3692  013000
3693  013000
3694  013000  020027  062366
3695  013004  103002
3696  013006
3697  013006  005020
3698  013010
3699  013010  000773
3700  013012
3701  013012
3702  013012  004737  055330
3703  013016
3704  013016  112737  000010  061766
```

```
 3705  013024
 3706  013024  076143                  INLINE  <SPANCI>
 3707  013026
 3708  013026  013170                  INLINE  <.WORD  TSPNCI>
 3709  013030
 3710  013030  013174                  INLINE  <.WORD  TSPNCI+4>
 3711  013032
 3712  013032  013737  177776  000474  LET TEMP0 := PSW
 3713  013040
 3714  013040  032737  000017  000474  INLINE  <BIT    #17,TEMP0>
 3715  013046
 3716  013046  001402                  IFCOND NE THEN
 3717  013050
 3718  013050  004737  056274                  CALL ERROR
 3719  013054                          ENDIF
 3720  013054
 3721  013054                          LET TEMP0 := #BUFLEN-50
 3722  013054  012737  000030  000474
 3723  013062                          IF R0 NE TEMP0 THEN
 3724  013062  020037  000474
 3725  013066  001402
 3726  013070                                  CALL ERROR
 3727  013070  004737  056274
 3728  013074                          ENDIF
 3729  013074
 3730  013074                          IF R1 NE #BUFF1+50 THEN
 3731  013074  020127  061236
 3732  013100  001402
 3733  013102                                  CALL ERROR
 3734  013102  004737  056274
 3735  013106                          ENDIF
 3736  013106
 3737  013106                          IF R2 NE #0 THEN
 3738  013106  005702
 3739  013110  001402
 3740  013112                                  CALL ERROR
 3741  013112  004737  056274
 3742  013116                          ENDIF
 3743  013116
 3744  013116                          IF R3 NE #0 THEN
 3745  013116  005703
 3746  013120  001402
 3747  013122                                  CALL ERROR
 3748  013122  004737  056274
 3749  013126                          ENDIF
 3750  013126
 3751  013126                          IF R4 NE #0 THEN
 3752  013126  005704
 3753  013130  001402
 3754  013132                                  CALL ERROR
 3755  013132  004737  056274
 3756  013136                          ENDIF
 3757  013136
 3758  013136                          IF R5 NE #0 THEN
 3759  013136  005705
 3760  013140  001402
```

```
                SPANCI
                .WORD   TSPNCI
                .WORD   TSPNCI+4
                MOV     PSW,TEMP0
                BIT     #17,TEMP0
                BEQ     $50421
                JSR     PC,ERROR
$50421:
                MOV     #BUFLEN-50,TEMP0
                CMP     R0,TEMP0
                BEQ     $50422
                JSR     PC,ERROR
$50422:
                CMP     R1,#BUFF1+50
                BEQ     $50423
                JSR     PC,ERROR
$50423:
                TST     R2
                BEQ     $50424
                JSR     PC,ERROR
$50424:
                TST     R3
                BEQ     $50425
                JSR     PC,ERROR
$50425:
                TST     R4
                BEQ     $50426
                JSR     PC,ERROR
$50426:
                TST     R5
                BEQ     $50427
```

```
3761  013142
3762  013142  004737  056274                    CALL ERROR                                                  JSR     PC,ERROR
3763  013146                                    ENDIF
3764  013146                                                                                        $50427:
3765  013146                                    INLINE   <JMP   XCMPC>                                      JMP     XCMPC
3766  013146  000137  013200
3767
3768                                            ;+
3769                                            ; TABLE OF TEST CASES FOR SPANC
3770                                            ;-
3771
3772  013152  000003                           TSPANC: .WORD   3               ;# OF TEST CASES FOR SPANC
3773
3774  013154  000000                                   .WORD   0                       ;SRC.LEN
3775  013156  000030                                   .WORD   30                      ;OFFSET
3776
3777  013160  000100                                   .WORD   BUFLEN          ;TEST CASE NUMBER 2
3778  013162  000040                                   .WORD   40
3779
3780  013164  000100                                   .WORD   BUFLEN          ;TEST CASE NUMBER 3
3781  013166  000104                                   .WORD   BUFLEN+4
3782
3783
3784  013170  000100                           TSPNCI: .WORD   BUFLEN          ;TEST CASE FOR INLINE
3785  013172  061166                                   .WORD   BUFF1
3786  013174  000010                                   .WORD   10
3787  013176  061766                                   .WORD   CHRSET
```

```
                                        .SBTTL  CMPC
                                        ;;*****************************************************************
                                        ;
                                        ;  CMPC TEST
                                        ;
                                        ;;*****************************************************************
013200                                  INLINE  <XCMPC:>
013200                                                                          XCMPC:
013200                                  INLINE  <SCOPE>
013200  000004                                                                  SCOPE
013202                                  LET $TIMES := #20               ;ITERATION COUNT
013202  012737  000020  000404                                                 MOV     #20,$TIMES
013210                                  LET COUNT := TCMPC              ;GET TEST COUNT
013210  013737  014152  000466                                                 MOV     TCMPC,COUNT
013216                                  LET TSTCAS := #TCMPC+2          ;POINT TO FIRST TEST CASE
013216  012737  014154  000542                                                 MOV     #TCMPC+2,TSTCAS
                                        ;REPEAT
013224                                  INLINE  <$5044:>
013224                                                                          $5044:
                                                ;+
                                                ; GET TEST DATA FROM TABLE
                                                ;-
013224                                          LET R0 := TSTCAS
013224  013700  000542                                                         MOV     TSTCAS,R0
013230                                          LET DATA00 := (R0)+             ;SRC1.LEN
013230  012037  000560                                                         MOV     (R0)+,DATA00
013234                                          LET DATA01 := (R0)+             ;SRC2.LEN
013234  012037  000562                                                         MOV     (R0)+,DATA01
013240                                          LET DATA02 := (R0)              ;OFFSET
013240  011037  000564                                                         MOV     (R0),DATA02
                                                ;+
                                                ; SET UP GPR'S
                                                ;-
013244                                          LET R0 := DATA00                ;SRC1
013244  013700  000560                                                         MOV     DATA00,R0
013250                                          LET R1 := #BUFF1
013250  012701  061166                                                         MOV     #BUFF1,R1
013254                                          LET R2 := DATAC1                ;SRC2
013254  013702  000562                                                         MOV     DATA01,R2
013260                                          LET R3 := #BUF'2
013260  012703  061266                                                         MOV     #BUFF2,R3
013264                                          LET R4 := #377                  ;FILL CHARACTER
013264  012704  000377                                                         MOV     #377,R4
013270                                          LET OFFSET := DATA02            ;OFFSET
013270  013737  000564  000510                                                 MOV     DATA02,OFFSET
013276                                          INLINE  <BIT    #BIT00,COUNT>
013276  032737  000001  000466                                                 BIT     #BIT00,COUNT
013304                                          IFCOND EQ THEN
013304  001002                                                                 BNE     $50430
013306                                              LET R5 := #0
013306  005005                                                                 CLR     R5
013310                                          ELSE
```

```
3844  013310  000402                                                          BR      $50431
3845  013312                                                          $50430:
3846  013312                          LET R5 := #177777
3847  013312  012705  177777                                                 MOV     #177777,R5
3848  013316                      ENDIF
3849  013316                                                          $50431:
3850
3851                              ;+
3852                              ; SET UP BUFFERS
3853                              ;-
3854
3855  013316                      LET BFADRS := #BUFF1
3856  013316  012737  061166  000540                                         MOV     #BUFF1,BFADRS
3857  013324                      CALL SETBUF
3858  013324  004737  055410                                                 JSR     PC,SETBUF
3859  013330                      LET BFADRS := #BUFF2
3860  013330  012737  061266  000540                                         MOV     #BUFF2,BFADRS
3861  013336                      CALL SETBUF
3862  013336  004737  055410                                                 JSR     PC,SETBUF
3863  013342                      IF DATA00 HI DATA01 THEN
3864  013342  023737  000560  000562                                         CMP     DATA00,DATA01
3865  013350  101412                                                         BLOS    $50432
3866  013352                          LET TEMP0 := OFFSET + #BUFF1
3867  013352  013737  000510  000474                                         MOV     OFFSET,TEMP0
3868  013360  062737  061166  000474                                         ADD     #BUFF1,TEMP0
3869  013366                          LET CC.EXP := #1
3870  013366  012737  000001  000520                                         MOV     #1,CC.EXP
3871  013374                      ELSE
3872  013374  000411                                                         BR      $50433
3873  013376                                                          $50432:
3874  013376                          LET TEMP0 := OFFSET + #BUFF2
3875  013376  013737  000510  000474                                         MOV     OFFSET,TEMP0
3876  013404  062737  061266  000474                                         ADD     #BUFF2,TEMP0
3877  013412                          LET CC.EXP := #10
3878  013412  012737  000010  000520                                         MOV     #10,CC.EXP
3879  013420                      ENDIF
3880  013420                                                          $50433:
3881  013420                      LET @TEMP0 :B- #0
3882  013420  105077  165050                                                 CLRB    @TEMP0
3883
3884                              ;+
3885                              ; SET UP EXPECTED GPR'S AND CONDITION CODES
3886                              ;-
3887
3888  013424                      LET R0.EXP :- R0 - DATA02
3889  013424  010037  000522                                                 MOV     R0,R0.EXP
3890  013430  163737  000564  000522                                         SUB     DATA02,R0.EXP
3891  013436                      LET R1.EXP := R1 + DATA02
3892  013436  010137  000524                                                 MOV     R1,R1.EXP
3893  013442  063737  000564  000524                                         ADD     DATA02,R1.EXP
3894  013450                      LET R2.EXP :- R2 - DATA02
3895  013450  010237  000526                                                 MOV     R2,R2.EXP
3896  013454  163737  000564  000526                                         SUB     DATA02,R2.EXP
3897  013462                      LET R3.EXP :- R3 + DATA02
3898  013462  010337  000530                                                 MOV     R3,R3.EXP
3899  013466  063737  000564  000530                                         ADD     DATA02,R3.EXP
```

```
3900  013474                          LET R4.EXP := R4                                    MOV     R4,R4.EXP
3901  013474  010437  000532
3902  013500                          LET R5.EXP := R5                                    MOV     R5,R5.EXP
3903  013500  010537  000534
3904  013504                          IF DATA02 HIS DATA00 THEN                           CMP     DATA02,D   100
3905  013504  023737  000564  000560                                                      BLO     $50434
3906  013512  103406
3907  013514                              LET R0.EXP := #0                                CLR     R0.EXP
3908  013514  005037  000522
3909  013520                              LET R1.EXP := R1 + R0                           MOV     R1,R1.EXP
3910  013520  010137  000524                                                             ADD     R0,R1.EXP
3911  013524  060037  000524
3912  013530                          ENDIF
3913  013530                                                                          $50434:
3914  013530                          IF DATA02 HIS DATA01 THEN                           CMP     DATA02,DATA01
3915  013530  023737  000564  000562                                                      BLO     $50435
3916  013536  103406
3917  013540                              LET R2.EXP := #0                                CLR     R2.EXP
3918  013540  005037  000526
3919  013544                              LET R3.EXP := R3 + R2                           MOV     R3,R3.EXP
3920  013544  010337  000530                                                             ADD     R2,R3.EXP
3921  013550  060237  000530
3922  013554                          ENDIF
3923  013554                                                                          $50435:
3924  013554                          IF DATA02 HIS DATA00 AND DATA02 HIS DATA01 THEN     CMP     DATA02,DATA00
3925  013554  023737  000564  000560                                                      BLO     $50436
3926  013562  103407                                                                     CMP     DATA02,DATA01
3927  013564  023737  000564  000562                                                      BLO     $50436
3928  013572  103403
3929  013574                              LET CC.EXP := #4                                MOV     #4,CC.EXP
3930  013574  012737  000004  000520
3931  013602                          ENDIF
3932  013602                                                                          $50436:
3933
3934                                  ;+
3935                                  ; DO THE CIS INSTRUCTION
3936                                  ;-
3937
3938  013602                          INLINE  <CMPC>
3939  013602  076044                                                                     CMPC
3940
3941                                  ;+
3942                                  ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
3943                                  ;-
3944
3945  013604                          LET CC := PSW
3946  013604  013737  177776  000516                                                      MOV     PSW,CC
3947  013612                          LET CC := CC CLR.BY #177760
3948  013612  042737  177760  000516                                                      BIC     #177760,CC
3949  013620                          IF CC NE CC.EXP THEN
3950  013620  023737  000516  000520                                                      CMP     CC,CC.EXP
3951  013626  001402                                                                     BEQ     $50437
3952  013630                              CALL ERROR
3953  013630  004737  056274                                                            JSR     PC,ERROR
3954  013634                          ENDIF
3955  013634                                                                          $50437:
```

```
3956  013634
3957  013634  020037  000522          IF R0 NE R0.EXP THEN
3958  013640  001402                                                  CMP     R0,R0.EXP
3959  013642                                                          BEQ     $50440
3960  013642  004737  056274              CALL ERROR
3961  013646                                                          JSR     PC,ERROR
3962  013646                          ENDIF
3963  013646                                                  $50440:
3964  013646  020137  000524          IF R1 NE R1.EXP THEN
3965  013652  001402                                                  CMP     R1,R1.EXP
3966  013654                                                          BEQ     $50441
3967  013654  004737  056274              CALL ERROR
3968  013660                                                          JSR     PC,ERROR
3969  013660                          ENDIF
3970  013660                                                  $50441:
3971  013660  020237  000526          IF R2 NE R2.EXP THEN
3972  013664  001402                                                  CMP     R2,R2.EXP
3973  013666                                                          BEQ     $50442
3974  013666  004737  056274              CALL ERROR
3975  013672                                                          JSR     PC,ERROR
3976  013672                          ENDIF
3977  013672                                                  $50442:
3978  013672  020337  000530          IF R3 NE R3.EXP THEN
3979  013676  001402                                                  CMP     R3,R3.EXP
3980  013700                                                          BEQ     $50443
3981  013700  004737  056274              CALL ERROR
3982  013704                                                          JSR     PC,ERROR
3983  013704                          ENDIF
3984  013704                                                  $50443:
3985  013704  020437  000532          IF R4 NE R4.EXP THEN
3986  013710  001402                                                  CMP     R4,R4.EXP
3987  013712                                                          BEQ     $50444
3988  013712  004737  056274              CALL ERROR
3989  013716                                                          JSR     PC,ERROR
3990  013716                          ENDIF
3991  013716                                                  $50444:
3992  013716  020537  000534          IF R5 NE R5.EXP THEN
3993  013722  001402                                                  CMP     R5,R5.EXP
3994  013724                                                          BEQ     $50445
3995  013724  004737  056274              CALL ERROR
3996  013730                                                          JSR     PC,ERROR
3997  013730                          ENDIF
3998  013730                                                  $50445:
3999  013730  062737  000006  000542      LET TSTCAS := TSTCAS + #6
4000  013736                                                          ADD     #6,TSTCAS
4001  013736  005337  000466              LET COUNT := COUNT - #1
4002                                                                  DEC     COUNT
4003  013742                          ;UNTIL COUNT EQ #0
4004  013742  005737  000466          IF COUNT NE #0 THEN
4005  013746  001402                                                  TST     COUNT
4006  013750                                                          BEQ     $50446
4007  013750  000137  013224              INLINE  <JMP    $5044>
4008  013754                                                          JMP     $5044
4009  013754                          ENDIF
4010                                                            $50446:
4011
```

```
4012                                    ;+
4013                                    ; DO ONE INLINE CASE - CMPCI
4014                                    ;-
4015
4016  013754                            LET BFADRS := #BUFF1
4017  013754  012737  061166  000540                                    MOV     #BUFF1,BFADRS
4018  013762                            CALL CLRBUF
4019  013762  004737  055346                                          JSR     PC,CLRBUF
4020  013766                            LET BFADRS := #BUFF2
4021  013766  012737  061266  000540                                    MOV     #BUFF2,BFADRS
4022  013774                            CALL CLRBUF
4023  013774  004737  055346                                          JSR     PC,CLRBUF
4024  014000                            CALL CLRREG
4025  014000  004737  055330                                          JSR     PC,CLRREG
4026  014004                            LET TEMP0 := #BUFF1 + #40
4027  014004  012737  061166  000474                                    MOV     #BUFF1,TEMP0
4028  014012  062737  000040  000474                                    ADD     #40,TEMP0
4029  014020                            LET @TEMP0 :B= #377
4030  014020  112777  000377  164446                                    MOVB    #377,@TEMP0
4031  014026                            INLINE  <CMPCI>
4032  014026  076144                                                   CMPCI
4033  014030                            INLINE  <.WORD  TCMPCI>
4034  014030  014234                                                   .WORD   TCMPCI
4035  014032                            INLINE  <.WORD  TCMPCI+4>
4036  014032  014240                                                   .WORD   TCMPCI+4
4037  014034                            INLINE  <.WORD  0>
4038  014034  000000                                                   .WORD   0
4039  014036                            LET TEMP0 := PSW
4040  014036  013737  177776  000474                                    MOV     PSW,TEMP0
4041  014044                            LET TEMP0 := TEMP0 CLR.BY #177760
4042  014044  042737  177760  000474                                    BIC     #177760,TEMP0
4043  014052                            IF TEMP0 NE #10 THEN
4044  014052  023727  000474  000010                                    CMP     TEMP0,#10
4045  014060  001402                                                   BEQ     $50447
4046  014062                                  CALL ERROR
4047  014062  004737  056274                                          JSR     PC,ERROR
4048  014066                            ENDIF
4049  014066                                                    $50447:
4050  014066                            IF R0 NE #0 THEN
4051  014066  005700                                                   TST     R0
4052  014070  001402                                                   BEQ     $50450
4053  014072                                  CALL ERROR
4054  014072  004737  056274                                          JSR     PC,ERROR
4055  014076                            ENDIF
4056  014076                                                    $50450:
4057  014076                            IF R1 NE #0 THEN
4058  014076  005701                                                   TST     R1
4059  014100  001402                                                   BEQ     $50451
4060  014102                                  CALL ERROR
4061  014102  004737  056274                                          JSR     PC,ERROR
4062  014106                            ENDIF
4063  014106                                                    $50451:
4064  014106                            IF R2 NE #0 THEN
4065  014106  005702                                                   ST      R2
4066  014110  001402                                                   BEQ     $50452
4067  014112                                  CALL ERROR
```

```
 4068  014112  004737  056274                                                        JSR     PC,ERROR
 4069  014116                        ENDIF
 4070  014116                                                                    $50452:
 4071  014116                        IF R3 NE #0 THEN
 4072  014116  005703                                                            TST     R3
 4073  014120  001402                                                            BEQ     $50453
 4074  014122                                CALL ERROR
 4075  014122  004737  056274                                                    JSR     PC,ERROR
 4076  014126                        ENDIF
 4077  014126                                                                    $50453:
 4078  014126                        IF R4 NE #0 THEN
 4079  014126  005704                                                            TST     R4
 4080  014130  001402                                                            BEQ     $50454
 4081  014132                                CALL ERROR
 4082  014132  004737  056274                                                    JSR     PC,ERROR
 4083  014136                        ENDIF
 4084  014136                                                                    $50454:
 4085  014136                        IF R5 NE #0 THEN
 4086  014136  005705                                                            TST     R5
 4087  014140  001402                                                            BEQ     $50455
 4088  014142                                CALL ERROR
 4089  014142  004737  056274                                                    JSR     PC,ERROR
 4090  014146                        ENDIF
 4091  014146                                                                    $50455:
 4092  014146                        INLINE  <JMP    XMATC>
 4093  014146  000137  014244                                                    JMP     XMATC
 4094
 4095                                ;+
 4096                                ; TABLE OF TEST CASES FOR CMPC
 4097                                ;-
 4098
 4099  014152  000010                TCMPC:  .WORD   8.              ;# OF TEST CASES FOR CMPC
 4100
 4101  014154  000000                        .WORD   0                       ;SRC1.LEN
 4102  014156  000020                        .WORD   20                      ;SRC2.LEN
 4103  014160  000040                        .WORD   40                      ;OFFSET
 4104
 4105  014162  000010                        .WORD   10              ;TEST CASE NUMBER 2
 4106  014164  000030                        .WORD   30
 4107  014166  000007                        .WORD   7
 4108
 4109  014170  000044                        .WORD   44              ;TEST CASE NUMBER 3
 4110  014172  000070                        .WORD   70
 4111  014174  000060                        .WORD   60
 4112
 4113  014176  000030                        .WORD   30              ;TEST CASE NUMBER 4
 4114  014200  000050                        .WORD   50
 4115  014202  000060                        .WORD   60
 4116
 4117  014204  000000                        .WORD   0               ;TEST CASE NUMBER 5
 4118  014206  000000                        .WORD   0
 4119  014210  000010                        .WORD   10
 4120
 4121  014212  000060                        .WORD   60              ;TEST CASE NUMBER 6
 4122  014214  000040                        .WORD   40
 4123  014216  000030                        .WORD   30
```

```
 4124
 4125  014220  000057                        .WORD   57              ;TEST CASE NUMBER 7
 4126  014222  000033                        .WORD   33
 4127  014224  000045                        .WORD   45
 4128
 4129  014226  000020                        .WORD   20              ;TEST CASE NUMBER 8
 4130  014230  000011                        .WORD   11
 4131  014232  000023                        .WORD   23
 4132
 4133
 4134  014234  000060              TCMPCI:   .WORD   60              ;TEST CASE FOR INLINE
 4135  014236  061166                        .WORD   BUFF1
 4136  014240  000060                        .WORD   60
 4137  014242  061266                        .WORD   BUFF2
```

```
                        .SBTTL  MATC
                        ;;*****************************************************************
                        ;
                        ;  MATC TEST
                        ;
                        ;;*****************************************************************
014244                  INLINE  <XMATC:>                                        XMATC:
014244                  INLINE  <SCOPE>                                         SCOPE
014244  000004          LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
014246
014246  012737  000020  000404
                        LET COUNT := TMATC              ;GET TEST COUNT         MOV     TMATC,COUNT
014254
014254  013737  015150  000466
                        LET TSTCAS := #TMATC+2          ;POINT TO FIRST TEST CASE
014262                                                                          MOV     #TMATC+2,TSTCAS
014262  012737  015152  000542
                        ;REPEAT
014270                  INLINE  <$5045:>                                        $5045:
014270
                            ;+
                            ; GET TEST DATA FROM TABLE
                            ;-
                            LET R0 := TSTCAS
014270
014270  013700  000542                                                         MOV     TSTCAS,R0
                            LET DATA00 := (R0)+                 ;OBJ.LEN
014274                                                                          MOV     (R0)+,DATA00
014274  012037  000560
                            LET DATA01 :  (R0)                  ;OFFSET
014300                                                                          MOV     (R0),DATA01
014300  011037  000562
                            ;+
                            ; SET UP THE GPR'S
                            ;-
                            LET R0 :- #70                       ;SRC.LEN
014304                                                                          MOV     #70,R0
014304  012700  000070
                            LET R1 := #BUFF1                    ;SRC.ADR
014310                                                                          MOV     #BUFF1,R1
014310  012701  061166
                            LET R2 := DATA00
014314                                                                          MOV     DATA00,R2
014314  013702  000560
                            LET R3 := #BUFF2                    ;OBJ.LEN
014320                                                                          MOV     #BUFF2,R3
014320  012703  061266
                            INLINE  <BIT        #BIT00,COUNT>
014324                                                                          BIT     #BIT00,COUNT
014324  032737  000001  000466
                            IFCOND EQ THEN
014332                                                                          BNE     $50456
014332  001003
                                LET R4 := #0
014334                                                                          CLR     R4
014334  005004
                                LET R5 := #0
014336                                                                          CLR     R5
014336  005005
                            ELSE
014340                                                                          BR      $50457
014340  000404
                                                                        $50456:
014342
                                LET R4 := #177777
014342                                                                          MOV     #177777,R4
014342  012704  177777
```

```
4194  014346                          LET R5 :- #177777
4195  014346  012705  177777                                  MOV     #177777,R5
4196  014352                      ENDIF
4197  014352                                                $50457:
4198
4199                              ;+
4200                              ; SET UP THE BUFFERS
4201                              ;-
4202
4203  014352                      LET BFADRS := #BUFF1
4204  014352  012737  061166  000540                          MOV     #BUFF1,BFADRS
4205  014360                      CALL SETBUF
4206  014360  004737  055410                                  JSR     PC,SETBUF
4207  014364                      LET BFADRS := #BUFF2
4208  014364  012737  061266  00054C                          MOV     #BUFF2,BFADRS
4209  014372                      CALL CLRBUF
4210  014372  004737  055346                                  JSR     PC,CLRBUF
4211  014376                      IF DATA01 LO #70 THEN
4212  014376  023727  000562  000070                          CMP     DATA01,#70
4213  014404  103015                                          BHIS    $50460
4214  014406
4215  014406  063701  000562            LET R1 := R1 + DATA01
4216  014412                          REPEAT
4217  014412                                                $50461:
4218  014412
4219  014412  105021                      INLINE  <CLRB       (R1)+>
4220  014414
4221  014414  012737  061166  000474        LET TEMP0 := #BUFF1 + R0
4222  014422  060037  000474                                  MOV     #BUFF1,TEMP0
4223  014426                                                  ADD     R0,TEMP0
4224  014426  020137  000474          UNTIL R1 EQ TEMP0
4225  014432  001367                                         CMP     R1,TEMP0
4226  014434                                                  BNE     $50461
4227  014434  012701  061166          LET R1 := #BUFF1                ;RESTORE R1
4228  014440                                                  MOV     #BUFF1,R1
4229  014440                      ENDIF
4230                                                        $50460:
4231                              ;+
4232                              ; SET UP EXPECTED GPR'S AND CONDITION CODES
4233                              ;-
4234
4235  014440                      LET R0.EXP := R0
4236  014440  010037  000522                                  MOV     R0,R0.EXP
4237  014444                      LET R1.EXP := R1
4238  014444  010137  000524                                  MOV     R1,R1.EXP
4239  014450                      LET R2.EXP := R2
4240  014450  010237  000526                                  MOV     R2,R2.EXP
4241  014454                      LET R3.EXP := R3
4242  014454  010337  000530                                  MOV     R3,R3.EXP
4243  014460                      LET R4.EXP := R4
4244  014460  010437  000532                                  MOV     R4,R4.EXP
4245  014464                      LET R5.EXP := R5
4246  014464  010537  000534                                  MOV     R5,R5.EXP
4247  014470                      IF DATA00 HI #0 THEN
4248  014470  005737  000560                                  TST     DATA00
4249  014474  101432                                          BLOS    $50462
```

```
 4250  014476                                    LET TEMP0 := R0 - DATA01
 4251  014476  010037  000474                                                    MOV     R0,TEMP0
 4252  014502  163737  000562  000474                                           SUB     DATA01,TEMP0
 4253  014510
 4254  014510  023737  000474  000560          IF TEMP0 LO DATA00 THEN          CMP     TEMP0,DATA00
 4255  014516  103007                                                           BHIS    $50463
 4256  014520
 4257  014520  005037  000522                        LET R0.EXP := #0           CLR     R0.EXP
 4258  014524
 4259  014524  010037  000524                        LET R1.EXP := R0 + R1      MOV     R0,R1.EXP
 4260  014530  060137  000524                                                   ADD     R1,R1.EXP
 4261  014534
 4262  014534  000412                            ELSE                         BR      $50464
 4263  014536                                                                $50463:
 4264  014536
 4265  014536  010037  000522                        LET R0.EXP := R0 - DATA01  MOV     R0,R0.EXP
 4266  014542  163737  000562  000522                                           SUB     DATA01,R0.EXP
 4267  014550
 4268  014550  010137  000524                        LET R1.EXP := R1 + DATA01  MOV     R1,R1.EXP
 4269  014554  063737  000562  000524                                           ADD     DATA01,R1.EXP
 4270  014562                                    ENDIF
 4271  014562                                                                $50464:
 4272  014562                                ENDIF
 4273  014562                                                                $50462:
 4274  014562                                INLINE  <TST        R0.EXP>
 4275  014562  005737  000522                                                   TST     R0.EXP
 4276  014566                                LET CC.EXP := PSW                  MOV     PSW,CC.EXP
 4277  014566  013737  177776  000520
 4278  014574                                LET CC.EXP := CC.EXP CLR.BY #177760
 4279  014574  042737  177760  000520                                           BIC     #177760,CC.EXP
 4280
 4281                                          ;+
 4282                                          ; DO THE CIS INSTRUCTION
 4283                                          ;-
 4284
 4285  014602                                INLINE  <MATC>
 4286  014602  076045                                                           MATC
 4287
 4288                                          ;+
 4289                                          ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS
 4290                                          ;-
 4291
 4292  014604                                LET CC := PSW
 4293  014604  013737  177776  000516                                           MOV     PSW,CC
 4294  014612                                LET CC := CC CLR.BY #177760
 4295  014612  042737  177760  000516                                           BIC     #177760,CC
 4296  014620
 4297  014620  023737  000516  000520          IF CC NE CC.EXP THEN             CMP     CC,CC.EXP
 4298  014626  001402                                                           BEQ     $50465
 4299  014630
 4300  014630  004737  056274                        CALL ERROR                 JSR     PC,ERROR
 4301  014634                                ENDIF
 4302  014634                                                                $50465:
 4303  014634
 4304  014634  020037  000522                IF R0 NE R0.EXP THEN             CMP     R0,R0.EXP
 4305  014640  001402                                                           BEQ     $50466
```

```
 4306  014642
 4307  014642  004737  056274                    CALL ERROR                          JSR     PC,ERROR
 4308  014646                                ENDIF
 4309  014646                                                                    $50466:
 4310  014646                                IF R1 NE R1.EXP THEN                        CMP     R1,R1.EXP
 4311  014646  020137  000524                                                     BEQ     $50467
 4312  014652  001402
 4313  014654                                                                    JSR     PC,ERROR
 4314  014654  004737  056274                    CALL ERROR
 4315  014660                                ENDIF                               $50467:
 4316  014660
 4317  014660                                IF R2 NE R2.EXP THEN                        CMP     R2,R2.EXP
 4318  014660  020237  000526                                                     BEQ     $50470
 4319  014664  001402
 4320  014666                                                                    JSR     PC,ERROR
 4321  014666  004737  056274                    CALL ERROR
 4322  014672                                ENDIF                               $50470:
 4323  014672
 4324  014672                                IF R3 NE R3.EXP THEN                        CMP     R3,R3.EXP
 4325  014672  020337  000530                                                     BEQ     $50471
 4326  014676  001402
 4327  014700                                                                    JSR     PC,ERROR
 4328  014700  004737  056274                    CALL ERROR
 4329  014704                                ENDIF                               $50471:
 4330  014704
 4331  014704                                IF R4 NE R4.EXP THEN                        CMP     R4,R4.EXP
 4332  014704  020437  000532                                                     BEQ     $50472
 4333  014710  001402
 4334  014712                                                                    JSR     PC,ERROR
 4335  014712  004737  056274                    CALL ERROR
 4336  014716                                ENDIF                               $50472:
 4337  014716
 4338  014716                                IF R5 NE R5.EXP THEN                        CMP     R5,R5.EXP
 4339  014716  020537  000534                                                     BEQ     $50473
 4340  014722  001402
 4341  014724                                                                    JSR     PC,ERROR
 4342  014724  004737  056274                    CALL ERROR
 4343  014730                                ENDIF                               $50473:
 4344  014730
 4345  014730                                LET TSTCAS := TSTCAS + #4                   ADD     #4,TSTCAS
 4346  014730  062737  000004  000542
 4347  014736                                LET COUNT := COUNT - #1                     DEC     COUNT
 4348  014736  005337  000466
 4349                                  ;UNTIL COUNT EQ #0
 4350  014742                          IF COUNT NE #0 THEN                         TST     COUNT
 4351  014742  005737  000466                                                     BEQ     $50474
 4352  014746  001402
 4353  014750                                                                    JMP     $5045
 4354  014750  000137  014270                    INLINE  <JMP    $5045>
 4355  014754                          ENDIF                               $50474:
 4356  014754
 4357
 4358
 4359                                  ;+
 4360                                  ; DO ONE INLINE CASE - MATCI
 4361                                  ;-
```

```
4362
4363  014754                          LET BFADRS := #BUFF1
4364  014754  012737  061166  000540
4365  014762                          CALL SETBUF
4366  014762  004737  055410
4367  014766                          LET BFADRS := #BUFF2
4368  014766  012737  061266  000540
4369  014774                          CALL SETBUF
4370  014774  004737  055410
4371  015000                          LET R0 := #BUFF1
4372  015000  012700  061166
4373  015004                          REPEAT
4374  015004
4375  015004                              INLINF  <CLRB       (R0)+>
4376  015004  105020
4377  015006                          UNTIL R0 EQ #BUFF1+#40
4378  015006  020027  061226
4379  015012  001374
4380  015014                          CALL CLRREG
4381  015014  004737  055330
4382  015020                          INLINE  <MATCI>
4383  015020  076145
4384  015022                          INLINE  <.WORD  TMATCI>
4385  015022  015172
4386  015024                          INLINE  <.WORD  TMATCI+4>
4387  015024  015176
4388  015026                          LET CC := PSW
4389  015026  013737  177776  000516
4390  015034                          I"" INE  <BIT    #17,CC>
4391  015034  032737  000017  000516
4392  015042                          IFCOND NE THEN
4393  015042  001402
4394  015044                              CALL ERROR
4395  015044  004737  056274
4396  015050                          ENDIF
4397  015050
4398  015050                          IF R0 NE #30 THEN               ;SRC.LEN - 40
4399  015050  020027  000030
4400  015054  001402
4401  015056                              CALL ERROR
4402  015056  004737  056274
4403  015062                          ENDIF
4404  015062
4405  015062                          IF R1 NE #BUFF1+#40 THEN
4406  015062  020127  061226
4407  015066  001402
4408  015070                              CALL ERROR
4409  015070  004737  056274
4410  015074                          ENDIF
4411  015074
4412  015074                          IF R2 NE #0 THEN
4413  015074  005702
4414  015076  001402
4415  015100                              CALL ERROR
4416  015100  004737  056274
4417  015104                          ENDIF
```

```
                MOV     #BUFF1,BFADRS
                JSR     PC,SETBUF
                MOV     #BUFF2,BFADRS
                JSR     PC,SETBUF
                MOV     #BUFF1,R0
$50475:
                CLRB    (R0)+
                CMP     R0,#BUFF1+#40
                BNE     $50475
                JSR     PC,CLRREG
                MATCI
                .WORD   TMATCI
                .WORD   TMATCI+4
                MOV     PSW,CC
                BIT     #17,CC
                BEQ     $50476
                JSR     PC,ERROR
$50476:
                CMP     R0,#30
                BEQ     $50477
                JSR     PC,ERROR
$50477:
                CMP     R1,#BUFF1+#40
                BEQ     $50500
                JSR     PC,ERROR
$50500:
                TST     R2
                BEQ     $50501
                JSR     PC,ERROR
```

```
 4418  015104
 4419  015104                          IF R3 NE #0 THEN
 4420  015104  005703
 4421  015106  001402
 4422  015110                              CALL ERROR
 4423  015110  004737  056274
 4424  015114                          ENDIF
 4425  015114
 4426  015114                          IF R4 NE #0 THEN
 4427  015114  005704
 4428  015116  001402
 4429  015120                              CALL ERROR
 4430  015120  004737  056274
 4431  015124                          ENDIF
 4432  015124
 4433  015124                          IF R5 NE #0 THEN
 4434  015124  005705
 4435  015126  001402
 4436  015130                              CALL ERROR
 4437  015130  004737  056274
 4438  015134                          ENDIF
 4439  015134
 4440  015134                          IF R2 NE #0 THEN
 4441  015134  005702
 4442  015136  001402
 4443  015140                              CALL ERROR
 4444  015140  004737  056274
 4445  015144                          ENDIF
 4446  015144
 4447  015144                          INLINE  <JMP    INTST>
 4448  015144  000137  015202
 4449
 4450                                  ;+
 4451                                  ; TABLE OF TEST DATA FOR MATC
 4452                                  ;-
 4453
 4454  015150  000004                 TMATC:  .WORD   4               ;# OF TEST CASES FOR MATC
 4455
 4456  015152  000000                         .WORD   0                       ;OBJ.LEN
 4457  015154  000010                         .WORD   10                      ;OFFSET
 4458
 4459  015156  000074                         .WORD   74              ;TEST CASE NUMBER 2
 4460  015160  000010                         .WORD   10
 4461
 4462  015162  000040                         .WORD   40              ;TEST CASE NUMBER 3
 4463  015164  000020                         .WORD   20
 4464
 4465  015166  000040                         .WORD   40              ;TEST CASE NUMBER 4
 4466  015170  000050                         .WORD   50
 4467
 4468
 4469  015172  000070                 TMATCI: .WORD   70              ;TEST CASE FOR INLINE
 4470  015174  061166                         .WORD   BUFF1
 4471  015176  000010                         .WORD   10
 4472  015200  061266                         .WORD   BUFF2
 4473
```

```
$50501:
        TST     R3
        BEQ     $50502
        JSR     PC,ERROR
$50502:
        TST     R4
        BEQ     $50503
        JSR     PC,ERROR
$50503:
        TST     R5
        BEQ     $50504
        JSR     PC,ERROR
$50504:
        TST     R2
        BEQ     $50505
        JSR     PC,ERROR
$50505:
        JMP     INTST
```

```
4474                            ;;**********************************************************************
4475                            .SBTTL  IN..ERRUPTABILITY SUBTEST
4476                            ;;**********************************************************************
4477
4478                            ;+
4479                            ;       THIS SUBTEST VERIFIES THAT A CIS INSTRUCTION CAN BE
4480                            ;       SUSPENDED (USING CONSOLE TERMINAL PRINTER INTERRUPT).
4481                            ;-
4482
4483  015202                    INLINE  <INTST:>                                        INTST:
4484  015202                    INLINE  <SCOPE>                                         SCOPE
4485  015202
4486  015202  000004            LET $TIMES := #1              ;ITERATION COUNT          MOV     #1,$TIMES
4487  015204
4488  015204  012737  000001  000404  LET ERR := #2           ;SET UP FOR ERROR MSG     MOV     #2,ERR
4489  015212
4490  015212  012737  000002  000550  LET SAVPSW := PSW                                MOV     PSW,SAVPSW
4491  015220
4492  015220  013737  177776  000612  LET PSW := #PR7                                  MOV     #PR7,PSW
4493  015226
4494  015226  012737  000340  177776  LET TEMP0 := #0           ;SUSPENDED FLAG,1 INST SUSPENDED
4495  015234                                                                          CLR     TEMP0
4496  015234  005037  000474
4497  015240                    IF INTPAS EQ #0 THEN                                  TST     INTPAS
4498  015240  005737  000460                                                        BNE     $50506
4499  015244  001006
4500  015246                      LET DELAY := #13000                                 MOV     #13000,DELAY
4501  015246  012737  013000  000470
4502  015254                      LET INTPAS := #1                                    MOV     #1,INTPAS
4503  015254  012737  000001  000460
4504  015262                    ENDIF
4505  015262                                                                  $50506:
4506  015262                    LET TEMP4 := DELAY                                    MOV     DELAY,TEMP4
4507  015262  013737  000470  000504
4508
4509                            ;+
4510                            ;       SET UP TP VECTOR
4511                            ;-
4512
4513  015270                    LET TPS := #0               ;MAKE SURE INTERRUPT ENABLE IS OFF
4514  015270  005037  177564                                                         CLR     TPS
4515  015274                    LET TPVEC := #TPSRVC                                  MOV     #TPSRVC,TPVEC
4516  015274  012737  015532  000064
4517  015302                    LET TPVEC+2 := #PR7                                   MOV     #PR7,TPVEC+2
4518  015302  012737  000340  000066
4519
4520                            ;+
4521                            ;       SET UP FOR MOVTC INST
4522                            ;-
4523
4524  015310                    CALL SAVREG                 ;SAVE R0-R5
4525  015310  004737  055562                                                         JSR     PC,SAVREG
4526  015314                    REPEAT
4527  015314                                                                  $50507:
4528  015314                      LET TEMP1 := TEMP4
4529  015314  013737  000504  000476                                                MOV     TEMP4,TEMP1
```

```
4530  015322
4531  015322  012700  002000          LET R0 := #2000                                  MOV     #2000,R0
4532  015326
4533  015326  010002                  LET R2 := R0                                     MOV     R0,R2
4534  015330
4535  015330  012701  064102          LET R1 := #SPACE                                 MOV     #SPACE,R1
4536  015334
4537  015334  010103                  LET R3 := R1                                     MOV     R1,R3
4538  015336
4539  015336  005004                  LET R4 := #0          ;NO FILL REQUIRED          CLR     R4
4540  015340
4541  015340  012705  061366          LET R5 := #TRANS                                 MOV     #TRANS,R5
4542  015344
4543  015344                          WHILE #BIT07 NOTSETIN TPS DO                  $50510:
4544  015344  032737  000200  177564                                                   BIT     #BIT07,TPS
4545  015352  001001                                                                   BNE     $50511
4546  015354
4547  015354  000773                  ENDDO                                            BR      $50510
4548  015356                                                                        $50511:
4549  015356
4550  015356  005037  177566          LET TPB := #0              ;SEND CHARACTER TO THE XMIT BUFFER
4551  015362                                                                           CLR     TPB
4552  015362  005037  177566          LET TPB := #0              ;ALLOW FOR DOUBLE BUFFERING
4553  015366                                                                           CLR     TPB
4554  015366  012737  000100  177564  LET TPS := #BIT6           ;SET INTERRUPT ENABLE
4555  015374                                                                           MOV     #BIT6,TPS
4556  015374  012737  000000  177776  LET PSW := #PR0            ;ALLOW INTERRUPTS
4557  015402                                                                           MOV     #PR0,PSW
4558  015402                          INLINE    <LOOP2:>         ;DELAY...
4559  015402                                                                        LOOP2:
4560  015402  005337  000476          INLINE    <DEC @#TEMP1>                          DEC     @#TEMP1
4561  015406
4562  015406  001375                  INLINE    <BNE LOOP2>                            BNE     LOOP2
4563  015410
4564  015410  076032                  INLINE   <MOVTC>                               MOVTC
4565  015412
4566  015412  023727  000474  000001  UNTIL TEMP0 EQ #1 OR TEMP4 LT #40                CMP     TEMP0,#1
4567  015420  001404                                                                   BEQ     $50512
4568  015422  023727  000504  000040                                                   CMP     TEMP4,#40
4569  015430  002331                                                                   BGE     $50507
4570  015432                                                                        $50512:
4571  015432
4572  015432  023727  000474  000001  IF TEMP0 NE #1 THEN                            CMP     TEMP0,#1
4573  015440  001403                                                                   BEQ     $50513
4574  015442
4575  015442  004737  056274              CALL ERROR                ;PSW BIT08 DID NOT GET SET
4576  015446                          ELSE                                             JSR     PC,ERROR
4577  015446  000411                                                                   BR      $50514
4578  015450                                                                        $50513:
4579  015450
4580  015450  005737  000636            IF $PASS EQ #0 THEN                          TST     $PASS
4581  015454  001006                                                                   BNE     $50515
4582  015456
4583  015456  013737  000504  000470      LET DELAY := TEMP4 + #1000                 MOV     TEMP4,DELAY
4584  015464  062737  001000  000470                                                   ADD     #1000,DELAY
4585  015472                            ENDIF
```

```
 4586  015472                                                                                  $50515:
 4587  015472                        ENDIF
 4588  015472                                                                                  $50514:
 4589  015472
 4590  015472  012737  000340  177776        LET PSW := #PR7                                          MOV     #PR7,PSW
 4591  015500
 4592  015500  012737  000066  000064        LET TPVEC := #TPVEC+2                                    MOV     #TPVEC+2,TPVEC
 4593  015506
 4594  015506  005037  000066              LET TPVEC+2 := #0             ;RESTORE CONSOLE TRAP CATCHER
                                                                                                     CLR     TPVEC+2
 4595  015512
 4596  015512  005037  177564              LET TPS :- #0                 ;MAKE SURE INTERRUPT ENABLE IS OFF
                                                                                                     CLR     TPS
 4597  015516
 4598  015516  004737  055614              CALL RESREG                                              JSR     PC,RESREG
 4599  015522
 4600  015522  013737  000612  177776        LET PSW := SAVPSW                                        MOV     SAVPSW,PSW
 4601  015530
 4602  015530  000421                      INLINE  <BR     ILLTST>       ;BR AROUND INT SERVICE RTN
                                                                                                     BR      ILLTST
 4603
 4604                                      ;+
 4605                                      ;       TP INTERRUPT SERVICE ROUTINE
 4606                                      ;-
 4607
 4608  015532                              INLINE  <TPSRVC:>
 4609  015532                                                                                  TPSRVC:
 4610  015532
 4611  015532  005037  177564              LET TPS := #0                 ;TURN OFF INTERRUPT ENABLE
                                                                                                     CLR     TPS
 4612  015536
 4613  015536  016637  000002  000506        LET TEMP5 := 2(SP)                                       MOV     2(SP),TEMP5
 4614  015544
 4615  015544  032737  000400  000506        IF #BIT8 SETIN TEMP5 THEN                                BIT     #BIT8,TEMP5
 4616  015552  001404                                                                                 BEQ     $50516
 4617  015554
 4618  015554  012737  000001  000474          LET TEMP0 := #1             ;INST WAS SUSPENDED
                                                                                                     MOV     #1,TEMP0
 4619  015562                              ELSE
 4620  015562  000403                                                                                 BR      $50517
 4621  015564                                                                                  $50516:
 4622  015564
 4623  015564  162737  000030  000504          LET TEMP4 :  TEMP4 - #30    ;DECREMENT DELAY COUNTER AND TRY AGAIN
                                                                                                     SUB     #30,TEMP4
 4624  015572                              ENDIF
 4625  015572                                                                                  $50517:
 4626  015572
 4627  015572  000002                      INLINE  <RTI>
                                                                                                     RTI
 4628
```

```
                                ;;*****************************************************************
                                .SBTTL  ILLEGAL OPCODE SUBTEST
                                ;;*****************************************************************
                                ;+
                                ;       THIS SUBTEST VERIFIES THAT AN ILLEGAL CIS CLASS OPCODE
                                ;       (ILLOP=76033) CAUSES A RESERVED INSTRUCTION TRAP (TRAP 10)
                                ;-
                                INLINE  <ILLTST:>                                       ILLTST:
                                INLINE  <SCOPE>                                         SCOPE
                                LET $TIMES :- #20               ;ITERATION COUNT        MOV     #20,$TIMES
                                LET ERRFLG := #0                ;RESET ERROR FLAG       CLR     ERRFLG
                                LET ERR := #3                   ;ERROR MSG #            MOV     #3,ERR
                                LET SAVPSW := PSW                                       MOV     PSW,SAVPSW
                                LET PSW := #PR7                 ;LOCK OUT INTERRUPTS    MOV     #PR7,PSW
                                LET RESVEC :- #RESRTN                                   MOV     #RESRTN,RESVEC
                                INLINE  <ILLOP>                 ;DO ILLEGAL CODE        ILLOP
                                CALL ERROR                      ;DIDNT TRAP, ERROR      JSR     PC,ERROR
                                LET RESVEC :- #ILLRES           ;RESTORE RESERVED INSTRUCTION TRAP VECTOR
                                                                                        MOV     #ILLRES,RESVEC
                                INLINE  <JMP    CIS4END>        ;MODULE EXIT            JMP     CIS4END

                                ;+
                                ;       TRAP HANDLER
                                ;-
                                INLINE  <RESRTN:>                                       RESRTN:
                                IF ERRFLG EQ #0 THEN                                    TST     ERRFLG
                                                                                        BNE     $50520
                                  POP TEMP0,TEMP0               ;REMOVE PC,PSW PUSHED BY TRAP
                                                                                        MOV     (SP)+,TEMP0
                                                                                        MOV     (SP)+,TEMP0
                                ENDIF                                                   $50520:
                                LET ERRFLG :- #0                ;ENSURE ERROR FLAG IS RESET
                                                                                        CLR     ERRFLG
                                LET PSW :  SAVPSW                                       MOV     SAVPSW,PSW
                                LET RESVEC :- #ILLRES           ;RESTORE RESERVED INSTRUCTION TRAP VECTOR
                                                                                        MOV     #ILLRES,RESVEC
```

```
 4685
 4686  015716                          INLINE  <CIS4END:>
 4687  015716                                                                  CIS4END:
 4688
 4689
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;++
                                ;                C I S 5      M O D U L E
                                ;
                                ;  THIS MODULE TESTS THE ARITHMETIC CONVERT INSTRUCTIONS FOR
                                ;  PACKED, NUMERIC, AND LONG INTEGER DATA TYPES: CVTLP, CVTLN,
                                ;  CVTPL, CVTNL, CVTPN, AND CVTNP.
                                ;--
                                ;;*****************************************************************
                                ;;*****************************************************************



                                .SBTTL  CIS5 INITIALIZATION
                                ;;*****************************************************************
                                ;
                                ;  CIS5 INITIALIZATION
                                ;
                                ;;*****************************************************************

                                ;IF SWR<5:0> ARE CLEARED OR IF SWR<1> IS SET THEN EXECUTE
                                ;  THE CIS5 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

015716                          INLINE   <SCOPE>
015716  000004                                                                    SCOPE

015720                          LET TEMP0 := @SWR CLR.BY #177700
015720  017737  162502  000474                                                    MOV     @SWR,TEMP0
015726  042737  177700  000474                                                    BIC     #177700,TEMP0
015734                          IF TEMP0 NE #0 THEN
015734  005737  000474                                                            TST     TEMP0
015740  001406                                                                    BEQ     $50521
015742                            IF #BIT1 NOTSETIN TEMP0 THEN
015742  032737  000002  000474                                                    BIT     #BIT1,TEMP0
015750  001002                                                                    BNE     $50522
015752                              INLINE   <JMP   CIS5END>
015752  000137  031700                                                            JMP     CIS5END
015756                            ENDIF
015756                                                                  $50522:
015756                          ENDIF
015756                                                                  $50521:
015756                          LET CTL :- #5                 ;CONTROL CHIP NUMBER
015756  012737  000005  000544                                                    MOV     #5,CTL
015764                          LET ERRFLG := #0              ;INITIALIZE ERROR FLAG
015764  005037  000454                                                            CLR     ERRFLG
015770                          LET PSW :- #340
015770  012737  000340  177776                                                    MOV     #340,PSW
015776                          LET ERR :  #1
015776  012737  000001  000550                                                    MOV     #1,ERR
```

```
                                        .SBTTL  CVTLP
                                        ;;*****************************************************************
                                        ;
                                        ;  CVTLP TEST
                                        ;
                                        ;;*****************************************************************
                                        INLINE  <XCVTLP:>
                                                                                                XCVTLP:
                                        INLINE  <SCOPE>
                                                                                                SCOPE
016004  000004                          LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
016006  012737  000020  000404          LET COUNT := TCVTLP             ;GET TEST COUNT         MOV     TCVTLP,COUNT
016014  013737  017314  000466          LET TSTCAS := #TCVTLP+2         ;POINT TO FIRST TEST CASE
016022  012737  017316  000542                                                                  MOV     #TCVTLP+2,TSTCAS
                                        ;REPEAT
                                        INLINE  <$5077:>
                                                                                                $5077:
                                            ;+
                                            ; GET TEST DATA FROM TABLE
                                            ;-
                                            LET R0 := TSTCAS
016030  013700  000542                                                                          MOV     TSTCAS,R0
                                            LET DATA00 := (R0)+             ;DST.DSCR
016034  012037  000560                                                                          MOV     (R0)+,DATA00
                                            LET DATA01 := (R0)+             ;LONG INTEGER HI
016040  012037  00056^                                                                          MOV     (R0)+,DATA01
                                            LET DATA02 := (R0)+             ;LONG INTEGER LO
016044  012037  000564                                                                          MOV     (R0)+,DATA02
                                            ;+
                                            ; PUT EXPECTED RESULTS INTO DS.EXP AND CC.EXP
                                            ;-
                                            CALL CLRDSB                     ;CLEAR DECIMAL STRING BUFFER AREAS
016050  004737  055520                                                                          JSR     PC,CLRDSB
                                            LET R2 := DATA01
016054  013702  000562                                                                          MOV     DATA01,R2
                                            LET R3 := DATA02
016060  013703  000564                                                                          MOV     DATA02,R3
                                            CALL CVTLI                      ;CONVERT LONG INTEGER TO AN INTERMEDIATE FORM
016064  004737  030362                                                                          JSR     PC,CVTLI
                                            LET CC.EXP :- #0
016070  005037  000520                                                                          CLR     CC.EXP
                                            LET DSLEN2 :- DATA00 CLR.BY #177740     ;GET DST.LEN
016074  013737  000560  000514                                                                MOV     DATA00,DSLEN2
016102  042737  177740  000514                                                                BIC     #177740,DSLEN2
                                            IF DSLEN2 EQ #0 THEN            ;DST.LEN - 0
016110  005737  000514                                                                        TST     DSLEN2
016114  001014                                                                                BNE     $50523
                                                LET CC.EXP := CC.EXP SET.BY #ZBIT
016116  052737  000004  000520                                                                BIS     #ZBIT,CC.EXP
                                                LET DS.EXP :B- #14
016124
```

```
4798  016124  112737  000014  062536                                                  MOVB    #14,DS.EXP
4799  016132
4800  016132  005737  000512                                                          TST     DSLEN1
4801  016136  101403                                                                  BLOS    $50524
4802  016140
4803  016140  052737  000002  000520                                                  BIS     #VBIT,CC.EXP
4804  016146
4805  016146                                                                  $50524:
4806  016146
4807  016146                                                                  $50523:
4808  016146
4809  016146  005737  000514                                                          TST     DSLEN2
4810  016152  001577                                                                  BEQ     $50525
4811  016154
4812  016154  005737  000512                                                          TST     DSLEN1
4813  016160  001017                                                                  BNE     $50526
4814  016162
4815  016162  013737  000514  000474                                                  MOV     DSLEN2,TEMP0
4816  016170
4817  016170  006237  000474                                                          ASR     TEMP0
4818  016174
4819  016174  012700  062536                                                          MOV     #DS.EXP,R0
4820  016200  063700  000474                                                          ADD     TEMP0,R0
4821  016204
4822  016204  112710  000014                                                          MOVB    #14,(R0)
4823  016210
4824  016210  052737  000004  000520                                                  BIS     #ZBIT,CC.EXP
4825  016216
4826  016216  000555                                                                  BR      $50527
4827  016220
4828  016220                                                                  $50526:
4829  016220  023737  000514  000512                                                  CMP     DSLEN2,DSLEN1
4830  016226  001010                                                                  BNE     $50530
4831  016230
4832  016230  012701  062370                                                          MOV     #DSBUF1,R1
4833  016234  062701  000012                                                          ADD     #10.,R1
4834  016240  163701  000512                                                          SUB     DSLEN1,R1
4835  016244
4836  016244  012702  062536                                                          MOV     #DS.EXP,R2
4837  016250
4838  016250                                                                  $50530:
4839  016250
4840  016250  023737  000514  000512                                                  CMP     DSLEN2,DSLEN1
4841  016256  002016                                                                  BGE     $50531
4842  016260
4843  016260  012701  062370                                                          MOV     #DSBUF1,R1
4844  016264  062701  000012                                                          ADD     #10.,R1
4845  016270  163701  000514                                                          SUB     DSLEN2,R1
4846  016274
4847  016274  012702  062536                                                          MOV     #DS.EXP,R2
4848  016300
4849  016300  052737  000002  000520                                                  BIS     #VBIT,CC.EXP
4850  016306
4851  016306  013737  000514  000512                                                  MOV     DSLEN2,DSLEN1
4852  016314
4853  016314                                                                  $50531:
```

```
IF DSLEN1 HI #0 THEN

  LET CC.EXP := CC.EXP SET.BY #VBIT

ENDIF

ENDIF

IF DSLEN2 NE #0 THEN                                    ;DST.LEN > 0

    IF DSLEN1 EQ #0 THEN                                  ;SRC.LEN = 0

        LET TEMP0 :- DSLEN2

        INLINE  <ASR  TEMP0>

        LET R0 := #DS.EXP + TEMP0


        LET (R0) :B= #14

        LET CC.EXP := CC.EXP SET.BY #ZBIT

    ELSE

ELSE

    IF DSLEN2 EQ DSLEN1 THEN                          ;DST.LEN = SRC.LEN > 0

        LET R1 := #DSBUF1 + #10. - DSLEN1               ;SRC POINTER


        LET R2 := #DS.EXP                               ;DST POINTER

    ENDIF

    IF DSLEN2 LT DSLEN1 THEN                        ;DST.LEN < SRC.LEN

        LET R1 :- #DSBUF1 + #10. - DSLEN2


        LET R2 := #DS.EXP

        LET CC.EXP := CC.EXP SET.BY #VBIT

        LET DSLEN1 := DSLEN2

    ENDIF
```

```
4854  016314
4855  016314  023737  000514  000512      IF DSLEN2 GT DSLEN1 THEN            ;DST.LEN > SRC.LEN
4856  016322  003426                              CMP     DSLEN2,DSLEN1
4857  016324                                      BLE     $50532
4858  016324  013737  000512  000474          LET TEMP0 := DSLEN1
4859  016332                                      MOV     DSLEN1,TEMP0
4860  016332  006237  000474                    INLINE  <ASR  TEMP0>
4861  016336                                      ASR  TEMP0
4862  016336  013737  000514  000476          LET TEMP1 := DSLEN2
4863  016344                                      MOV     DSLEN2,TEMP1
4864  016344  006237  000476                    INLINE  <ASR  TEMP1>
4865  016350                                      ASR  TEMP1
4866  016350  012702  062536                    LET R2 := #DS.EXP + TEMP1 - TEMP0
4867  016354  063702  000476                                MOV     #DS.EXP,R2
4868  016360  163702  000474                                ADD     TEMP1,R2
4869  016364                                      SUB     TEMP0,R2
4870  016364  012701  062370                    LET R1 := #DSBUF1 + #10. - DSLEN1   ;SRC POINTER
4871  016370  062701  000012                                MOV     #DSBUF1,R1
4872  016374  163701  000512                                ADD     #10.,R1
4873  016400                                      SUB     DSLEN1,R1
4874  016400                                  ENDIF
4875                                          $50532:
4876  016400
4877  016400  023727  000512  000001      ;LOAD REMAINING DIGITS INTO DS.EXP
4878  016406  101431                      IF DSLEN1 HI #1 THEN
4879  016410                                      CMP     DSLEN1,#1
4880  016410  032737  000001  000512              BLOS    $50533
4881  016416  001003                          IF #1 NOTSETIN DSLEN1 THEN
4882  016420                                      BIT     #1,DSLEN1
4883  016420  112122                              BNE     $50534
4884  016422                                  LET (R2)+ :B= (R1)+         ;OUTPUT TO DEST. BUFFER
4885  016422  005337  000512                        MOVB    (R1)+,(R2)+
4886  016426                                  LET DSLEN1 := DSLEN1 - #1
4887  016426                                      DEC     DSLEN1
4888  016426                                  ENDIF
4889  016426  005000                              $50534:
4890  016430                                  LET R0 := #0                ;USE R0 TO ASSEMBLE DATA
4891  016430                                      CLR     R0
4892  016430  023727  000512  000001          WHILE DSLEN1 HI #1 DO
4893  016436  101415                              $50535:
4894  016440                                      CMP     DSLEN1,#1
4895  016440  112100                              BLOS    $50536
4896  016442                                  LET R0 :B= (R1)+
4897  016442  072027  000004                        MOVB    (R1)+,R0
4898  016446                                  INLINE <ASH  #4,R0>
4899  016446  110037  000474                        ASH  #4,R0
4900  016452  152137  000474                LET TEMP0 :B= R0 OR (R1)+   ;OUTPUT TO DST. BUFFER
4901  016456                                      MOVB    R0,TEMP0
4902  016456  113722  000474                      BISB    (R1)+,TEMP0
4903  016462                                  LET (R2)+ :B= TEMP0
4904  016462  162737  000002  000512              MOVB    TEMP0,(R2)+
4905  016470                                  LET DSLEN1 := DSLEN1 - #2
4906  016470  000757                              SUB     #2,DSLEN1
4907  016472                                  ENDDO
4908  016472                                      BR      $50535
4909  016472                              ENDIF
                                            $50536:

                                            $50533:
```

```
4910  016472
4911  016472  112100                          LET R0 :B= (R1)+                                    MOVB    (R1)+,R0
4912  016474
4913  016474  072027  000004                  INLINE <ASH  #4,R0>                                 ASH  #4,R0
4914  016500
4915  016500  023727  000560  070000          IF DATA00 HIS #70000 THEN                       ;*** UNSIGNED PACKED ***
4916  016506  103404                                                                             CMP     DATA00,#70000
4917  016510                                                                                      BLO     $50537
4918  016510  110012                              LET (R2) :B= R0 OR #17                         MOVB    R0,(R2)
4919  016512  152712  000017                                                                     BISB    #17,(R2)
4920  016516
4921  016516  000415                          ELSE                                               BR      $50540
4922  016520                                                                                  $50537:
4923  016520                                       IF SIGN0 EQ #0 THEN                    ;*** SIGNED PACKED ***
4924  016520  005737  000446                                                                     TST     SIGN0
4925  016524  001004                                                                           BNE     $50541
4926  016526                                           LET (R2) :B= R0 OR #14          ;SIGN IS +
4927  016526  110012                                                                           MOVB    R0,(R2)
4928  016530  152712  000014                                                                   BISB    #14,(R2)
4929  016534
4930  016534  000406                               ELSE                                       BR      $50542
4931  016536                                                                                  $50541:
4932  016536                                           LET (R2) :B= R0 OR #15          ;SIGN IS -
4933  016536  110012                                                                           MOVB    R0,(R2)
4934  016540  152712  000015                                                                   BISB    #15,(R2)
4935  016544
4936  016544  052737  000010  000520              LET CC.EXP := CC.EXP SET.BY #NBIT           BIS     #NBIT,CC.EXP
4937  016552                                       ENDIF
4938  016552                                                                                  $50542:
4939  016552                                   ENDIF
4940  016552                                                                                  $50540:
4941  016552                                                                                  $50527:
4942  016552                               ENDIF
4943  016552                                                                                  $50525:
4944  016552
4945
4946                                       ;+
4947                                       ; SET UP GPR'S AND EXPECTED GPR'S.
4948                                       ;-
4949
4950  016552
4951  016552  013700  000560              LET R0 := DATA00                                    MOV     DATA00,R0
4952  016556
4953  016556  012701  062474              LET R1 := #DS.DST                ;DST. ADR          MOV     #DS.DST,R1
4954  016562
4955  016562  013702  000562              LET R2 := DATA01                                    MOV     DATA01,R2
4956  016566
4957  016566  013703  000564              LET R3 := DATA02                                    MOV     DATA02,R3
4958  016572
4959  016572  032737  000001  000466      IF #1 SETIN COUNT THEN                              BIT     #1,COUNT
4960  016600  001405                                                                           BEQ     $50543
4961  016602
4962  016602  012704  177777                  LET R4 := #177777                               MOV     #177777,R4
4963  016606
4964  016606  012705  177777                  LET R5 := #177777                               MOV     #177777,R5
4965  016612                               ELSE
```

```
 4966  016612  000402                                                          BR      $50544
 4967  016614                                                          $50543:
 4968  016614                          LET R4 := #0                            CLR     R4
 4969  016614  005004
 4970  016616                          LET R5 := #0                            CLR     R5
 4971  016616  005005
 4972  016620                      ENDIF
 4973  016620                                                          $50544:
 4974  016620                      LET R0.EXP := R0                        MOV     R0,R0.EXP
 4975  016620  010037  000522
 4976  016624                      LET R1.EXP := R1                        MOV     R1,R1.EXP
 4977  016624  010137  000524
 4978  016630                      LET R2.EXP := #0                        CLR     R2.EXP
 4979  016630  005037  000526
 4980  016634                      LET R3.EXP := #0                        CLR     R3.EXP
 4981  016634  005037  000530
 4982  016640                      LET R4.EXP := R4                        MOV     R4,R4.EXP
 4983  016640  010437  000532
 4984  016644                      LET R5.EXP := R5                        MOV     R5,R5.EXP
 4985  016644  010537  000534
 4986
 4987                              ;+
 4988                              ; DO THE CIS INSTRUCTION
 4989                              ;-
 4990
 4991  016650                      INLINE <CVTLP>
 4992  016650  076077                                                      CVTLP
 4993
 4994
 4995                              ;+
 4996                              ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
 4997                              ;-
 4998
 4999  016652                      LET CC := PSW
 5000  016652  013737  177776  000516                                      MOV     PSW,CC
 5001  016660                      LET CC := CC CLR.BY #177760
 5002  016660  042737  177760  000516                                      BIC     #177760,CC
 5003  016666                      IF CC NE CC.EXP THEN
 5004  016666  023737  000516  000520                                      CMP     CC,CC.EXP
 5005  016674  001402                                                      BEQ     $50545
 5006  016676                        CALL ERROR
 5007  016676  004737  056274                                            JSR     PC,ERROR
 5008  016702                      ENDIF
 5009  016702                                                          $50545:
 5010  016702                      IF R0 NE R0.EXP THEN
 5011  016702  020037  000522                                          CMP     R0,R0.EXP
 5012  016706  001402                                                  BEQ     $50546
 5013  016710                        CALL ERROR
 5014  016710  004737  056274                                        JSR     PC,ERROR
 5015  016714                      ENDIF
 5016  016714                                                      $50546:
 5017  016714                      IF R1 NE R1.EXP THEN
 5018  016714  020137  000524                                      CMP     R1,R1.EXP
 5019  016720  001402                                              BEQ     $50547
 5020  016722                        CALL ERROR
 5021  016722  004737  056274                                    JSR     PC,ERROR
```

```
5022  016726                          ENDIF
5023  016726
5024  016726                          IF R2 NE R2.EXP THEN                          $50547:
5025  016726  020237  000526                                                              CMP     R2,R2.EXP
5026  016732  001402                                                                      BEQ     $50550
5027  016734
5028  016734  004737  056274            CALL ERROR                                        JSR     PC,ERROR
5029  016740                          ENDIF
5030  016740                                                                        $50550:
5031  016740                          IF R3 NE R3.EXP THEN
5032  016740  020337  000530                                                              CMP     R3,R3.EXP
5033  016744  001402                                                                      BEQ     $50551
5034  016746
5035  016746  004737  056274            CALL ERROR                                        JSR     PC,ERROR
5036  016752                          ENDIF
5037  016752                                                                        $50551:
5038  016752                          IF R4 NE R4.EXP THEN
5039  016752  020437  000532                                                              CMP     R4,R4.EXP
5040  016756  001402                                                                      BEQ     $50552
5041  016760
5042  016760  004737  056274            CALL ERROR                                        JSR     PC,ERROR
5043  016764                          ENDIF
5044  016764                                                                        $50552:
5045  016764                          IF R5 NE R5.EXP THEN
5046  016764  020537  000534                                                              CMP     R5,R5.EXP
5047  016770  001402                                                                      BEQ     $50553
5048  016772
5049  016772  004737  056274            CALL ERROR                                        JSR     PC,ERROR
5050  016776                          ENDIF
5051  016776                                                                        $50553:
5052
5053                                  ;+
5054                                  ; COMPARE THE EXPECTED DECIMAL STRING BUFFER
5055                                  ; WITH ACTUAL RESULTS.
5056                                  ;-
5057
5058  016776                          LET R0 := #DS.DST                                     MOV     #DS.DST,R0
5059  016776  012700  062474
5060  017002                          LET R1 :- #DS.EXP                                     MOV     #DS.EXP,R1
5061  017002  012701  062536
5062  017006                          LET ERRFLG := #0                                      CLR     ERRFLG
5063  017006  005037  000454
5064  017012                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO    $50554:
5065  017012                                                                                CMP     R0,#DS.DST+40
5066  017012  020027  062534                                                              BEQ     $50555
5067  017016  001410                                                                      TST     ERRFLG
5068  017020  005737  000454                                                              BNE     $50555
5069  017024  001005
5070  017026                              IFB (R0)+ NE (R1)+ THEN                       CMPB    (R0)+,(R1)+
5071  017026  122021                                                                      BEQ     $50556
5072  017030  001402
5073  017032                                  CALL ERROR                                JSR     PC,ERROR
5074  017032  004737  056274
5075  017036                              ENDIF
5076  017036                                                                        $50556:
5077  017036                          ENDDO
```

```
5078  017036  000765                                                                                                  SEQ 0117
5079  017040
5080  017040                                                                                                                  BR      $50554
5081  017040  062737  000006  000542      LET TSTCAS := TSTCAS + #6                                                   $50555:
5082  017046                                                                                                                  ADD     #6,TSTCAS
5083  017046  005337  000466              LET COUNT := COUNT - #1                                                            DEC     COUNT
5084                                      ;UNTIL COUNT EQ #0
5085  017052                              IF COUNT NE #0 THEN                                                               TST     COUNT
5086  017052  005737  000466                                                                                              BEQ     $50557
5087  017056  001402
5088  017060                                  INLINE <JMP $5077>                                                            JMP $5077
5089  017060  000137  016030
5090  017064                              ENDIF                                                                       $50557:
5091  017064
5092
5093                                      ;+
5094                                      ; DO ONE IN-LINE CASE - CVTLPI
5095                                      ;-
5096
5097  017064                              CALL CLRREG                                                                       JSR     PC,CLRREG
5098  017064  004737  055330
5099  017070                              CALL CLRDSB                                                                       JSR     PC,CLRDSB
5100  017070  004737  055520
5101  017074                              INLINE  <CVTLPI>                                                                CVTLPI
5102  017074  076177
5103  017076                              INLINE  <.WORD  TCVLPI>                                                         .WORD   TCVLPI
5104  017076  017426
5105  017100                              INLINE  <.WORD  TCVLPI+4>                                                       .WORD   TCVLPI+4
5106  017100  017432
5107  017102                              LET CC := PSW                                                                   MOV     PSW,CC
5108  017102  013737  177776  000516
5109  017110                              LET CC := CC CLR.BY #177760                                                     BIC     #177760,CC
5110  017110  042737  177760  000516
5111  017116                              IF CC NE #0 THEN                                                                TST     CC
5112  017116  005737  000516                                                                                             BEQ     $50560
5113  017122  001402
5114  017124                                  CALL ERROR                                                                  JSR     PC,ERROR
5115  017124  004737  056274
5116  017130                              ENDIF                                                                       $50560:
5117  017130
5118  017130                              IF R0 NE #0 THEN                                                                TST     R0
5119  017130  005700                                                                                                     BEQ     $50561
5120  017132  001402
5121  017134                                  CALL ERROR                                                                  JSR     PC,ERROR
5122  017134  004737  056274
5123  017140                              ENDIF                                                                       $50561:
5124  017140
5125  017140                              IF R1 NE #0 THEN                                                                TST     R1
5126  017140  005701                                                                                                     BEQ     $50562
5127  017142  001402
5128  017144                                  CALL ERROR                                                                  JSR     PC,ERROR
5129  017144  004737  056274
5130  017150                              ENDIF                                                                       $50562:
5131  017150
5132  017150                              IF R2 NE #0 THEN                                                                TST     R2
5133  017150  005702
```

```
 5134  017152  001402                                                    BEQ     $50563
 5135  017154                        CALL ERROR
 5136  017154  004737  056274                                            JSR     PC,ERROR
 5137  017160                        ENDIF
 5138  017160                                                          $50563:
 5139  017160                        IF R3 NE #0 THEN
 5140  017160  005703                                                    TST     R3
 5141  017162  001402                                                    BEQ     $50564
 5142  017164                        CALL ERROR
 5143  017164  004737  056274                                            JSR     PC,ERROR
 5144  017170                        ENDIF
 5145  017170                                                          $50564:
 5146  017170                        IF R4 NE #0 THEN
 5147  017170  005704                                                    TST     R4
 5148  017172  001402                                                    BEQ     $50565
 5149  017174                        CALL ERROR
 5150  017174  004737  056274                                            JSR     PC,ERROR
 5151  017200                        ENDIF
 5152  017200                                                          $50565:
 5153  017200                        IF R5 NE #0 THEN
 5154  017200  005705                                                    TST     R5
 5155  017202  001402                                                    BEQ     $50566
 5156  017204                        CALL ERROR
 5157  017204  004737  056274                                            JSR     PC,ERROR
 5158  017210                        ENDIF
 5159  017210                                                          $50566:
 5160  017210                        LET R0 := #DS.DST
 5161  017210  012700  062474                                            MOV     #DS.DST,R0
 5162  017214                        IFB (R0)+ NE #1 THEN
 5163  017214  122027  000001                                            CMPB    (R0)+,#1
 5164  017220  001402                                                    BEQ     $50567
 5165  017222                        CALL ERROR
 5166  017222  004737  056274                                            JSR     PC,ERROR
 5167  017226                        ENDIF
 5168  017226                                                          $50567:
 5169  017226                        REPEAT
 5170  017226                                                          $50570:
 5171  017226                            IFB (R0)+ NE #21 THEN
 5172  017226  122027  000021                                            CMPB    (R0)+,#21
 5173  017232  001402                                                    BEQ     $50571
 5174  017234                                CALL ERROR
 5175  017234  004737  056274                                            JSR     PC,ERROR
 5176  017240                            ENDIF
 5177  017240                                                          $50571:
 5178  017240                        UNTIL R0 EQ #DS.DST+5
 5179  017240  020027  062501                                            CMP     R0,#DS.DST+5
 5180  017244  001370                                                    BNE     $50570
 5181  017246                        IFB (R0)+ NE #37 THEN
 5182  017246  122027  000037                                            CMPB    (R0)+,#37
 5183  017252  001402                                                    BEQ     $50572
 5184  017254                        CALL ERROR
 5185  017254  004737  056274                                            JSR     PC,ERROR
 5186  017260                        ENDIF
 5187  017260                                                          $50572:
 5188  017260                        LET ERRFLG :- #0
 5189  017260  005037  000454                                            CLR     ERRFLG
```

```
                                        REPEAT
                                            IFB (R0)+ NE #0 THEN
                                                CALL ERROR
                                            ENDIF
                                        UNTIL R0 EQ #DS.DST+40 OR ERRFLG NE #0
                                        INLINE  <JMP XCVTLN>
                                        ;+
                                        ; TABLE OF TEST CASES FOR CVTLP
                                        ;-
017314 000014                           TCVTLP: .WORD   12.             ;# OF TEST CASES FOR CVTLP
017316 060004                                   .WORD   60004                   ;DST. DATA TYPE AND LENGTH
017320 000000                                   .WORD   0                       ;LONG INTEGER HIGH & SIGN
017322 000000                                   .WORD   0                       ;LONG INTEGER LOW
017324 060020                                   .WORD   60020           ;TEST CASE NUMBER 2
017326 000000                                   .WORD   0
017330 001762                                   .WORD   1762
017332 060000                                   .WORD   60000           ;TEST CASE NUMBER 3
017334 000000                                   .WORD   0
017336 152361                                   .WORD   152361
017340 060010                                   .WORD   60010           ;TEST CASE NUMBER 4
017342 074377                                   .WORD   74377
017344 171700                                   .WORD   171700
017346 060006                                   .WORD   60006           ;TEST CASE NUMBER 5
017350 000000                                   .WORD   0
017352 075147                                   .WORD   75147
017354 060020                                   .WORD   60020           ;TEST CASE NUMBER 6
017356 077777                                   .WORD   77777
017360 177777                                   .WORD   177777
017362 060015                                   .WORD   60015           ;TEST CASE NUMBER 7
017364 100000                                   .WORD   100000
017366 000000                                   .WORD   0
017370 060010                                   .WORD   60010           ;TEST CASE NUMBER 8
017372 177755                                   .WORD   177755
017374 130070                                   .WORD   130070
```

```
                                        $50573:
                                                TSTB    (R0)+
                                                BEQ     $50574
                                                JSR     PC,ERROR
                                        $50574:
                                                CMP     R0,#DS.DST+40
                                                BEQ     $50575
                                                TST     ERRFLG
                                                BEQ     $50573
                                        $50575:
                                                JMP XCVTLN
```

```
 5246
 5247  017376  070010                        .WORD   70010           ;TEST CASE NUMBER 9
 5248  017400  177755                        .WORD   177755
 5249  017402  130070                        .WORD   130070
 5250
 5251  017404  060037                        .WORD   60037           ;TEST CASE NUMBER 10
 5252  017406  177777                        .WORD   177777
 5253  017410  177775                        .WORD   177775
 5254
 5255  017412  060003                        .WORD   60003           ;TEST CASE NUMBER 11
 5256  017414  000000                        .WORD   0
 5257  017416  000257                        .WORD   257
 5258
 5259  017420  060000                        .WORD   60000           ;TEST CASE NUMBER 12
 5260  017422  000000                        .WORD   0
 5261  017424  000000                        .WORD   0
 5262
 5263
 5264  017426                        TCVLPI:                         ;IN-LINE TEST CASE
 5265  017426  070012                        .WORD   70012                   ;DST TYPE = UNSIGNED PACKED, LENGTH = 12
 5266  017430  062474                        .WORD   DS.DST                  ;DST.ADDRESS
 5267  017432  032707                        .WORD   32707                   ;LONG INTEGER LOW WORD +
 5268  017434  041072                        .WORD   41072                   ;  LONG INTEGER HIGH WORD AND SIGN
 5269                                                                        ;  = 1111111111 IN BCD,
 5270                                                                        ;  = 1,21,21,21,21,21,37 IN PACKED BYTES
```

```
                        .SBTTL  CVTLN
                        ;;*****************************************************************
                        ;
                        ;  CVTLN TEST
                        ;
                        ;;*****************************************************************
                        INLINE  <XCVTLN:>
                                                                                XCVTLN:
                        INLINE  <SCOPE>
                                                                                SCOPE
                        LET $TIMES := #20               ;ITERATION COUNT        MOV     #20,$TIMES
                        LET COUNT := TCVTLN             ;GET TEST COUNT         MOV     TCVTLN,COUNT
                        LET TSTCAS := #TCVTLN+2         ;POINT TO FIRST TEST CASE
                                                                                MOV     #TCVTLN+2,TSTCAS
                        ;REPEAT
                        INLINE  <$5057:>
                                                                                $5057:
                            ;+
                            ; GET TEST DATA FROM TABLE
                            ;-

                            LET R0 := TSTCAS                                    MOV     TSTCAS,R0
                            LET DATA00 := (R0)+             ;DST. DATA TYPE AND LENGTH
                                                                                MOV     (R0)+,DATA00
                            LET DATA01 := (R0)+             ;LONG INTEGER HIGH
                                                                                MOV     (R0)+,DATA01
                            LET DATA02 := (R0)+             ;LONG INTEGER LOW
                                                                                MOV     (R0)+,DATA02

                            ;+
                            ; PUT EXPECTED RESULTS INTO DS.EXP AND CC.EXP
                            ;-

                            CALL CLRDSB                 ;CLEAR DECIMAL STRING BUFFER AREA
                                                                                JSR     PC,CLRDSB
                            LET R2 := DATA01
                                                                                MOV     DATA01,R2
                            LET R3 := DATA02
                                                                                MOV     DATA02,R3
                            CALL CVTLI                  ;CONVERT LONG INTEGER TO AN INTERMEDIATE FORM
                                                                                JSR     PC,CVTLI
                            LET CC.EXP :- #0
                                                                                CLR     CC.EXP
                            LET DSLEN2 :- DATA00 CLR.BY #177740         ;GET DST.LEN
                                                                                MOV     DATA00,DSLEN2
                                                                                BIC     #177740,DSLEN2
                            LET DATTYP :- DATA00 CLR.BY #107777         ;GET DATA TYPE
                                                                                MOV     DATA00,DATTYP
                                                                                BIC     #107777,DATTYP
                            IF DSLEN2 EQ #0 THEN                        ;DST.LEN = 0
                                                                                TST     DSLEN2
                                                                                BNE     $50576
```

```
5327  017564                                  LET CC.EXP := CC.EXP SET.BY #ZBIT
5328  017564  052737  000004  000520                                        BIS     #ZBIT,CC.EXP
5329  017572                                  IF DSLEN1 HI #0 THEN                ;INTERMEDIATE LENGTH > 0
5330  017572  005737  000512                                                TST     DSLEN1
5331  017576  101403                                                        BLOS    $50577
5332  017600
5333  017600  052737  000002  000520              LET CC.EXP := CC.EXP SET.BY #VBIT
5334  017606                                                                BIS     #VBIT,CC.EXP
5335  017606                                  ENDIF
5336  017606                                                              $50577:
5337  017606  023727  000462  040000          IF DATTYP EQ #40000 THEN            ;TRAILING SEPARATE
5338  017614  001015                                                        CMP     DATTYP,#40000
5339  017616                                                                BNE     $50600
5340  017616  005737  000446                      IF SIGN0 EQ #0 THEN
5341  017622  001004                                                        TST     SIGN0
5342  017624                                                                BNE     $50601
5343  017624  112737  000053  062536                  LET DS.EXP :B- #53
5344  017632                                                                MOVB    #53,DS.EXP
5345  017632  000406                              ELSE
5346  017634                                                                BR      $50602
5347  017634                                                              $50601:
5348  017634  112737  000055  062536                  LET DS.EXP :B= #55
5349  017642                                                                MOVB    #55,DS.EXP
5350  017642  052737  000010  000520                  LET CC.EXP := CC.EXP SET.BY #NBIT
5351  017650                                                                BIS     #NBIT,CC.EXP
5352  017650                                      ENDIF
5353  017650                                                              $50602:
5354  017650                                  ENDIF
5355  017650                                                              $50600:
5356  017650  023727  000462  050000          IF DATTYP EQ #50000 THEN            ;LEADING SEPARATE
5357  017656  001015                                                        CMP     DATTYP,#50000
5358  017660                                                                BNE     $50603
5359  017660  005737  000446                      IF SIGN0 EQ #0 THEN
5360  017664  001004                                                        TST     SIGN0
5361  017666                                                                BNE     $50604
5362  017666  112737  000053  062535                  LFT DS.EXP-1 :B= #53
5363  017674                                                                MOVB    #53,DS.EXP-1
5364  017674  000406                              ELSE
5365  017676                                                                BR      $50605
5366  017676                                                              $50604:
5367  017676  112737  000055  062535                  LET DS.EXP-1 :B= #55
5368  017704                                                                MOVB    #55,DS.EXP-1
5369  017704  052737  000010  000520                  LET CC.EXP := CC.EXP SET.BY #NBIT
5370  017712                                                                BIS     #NBIT,CC.EXP
5371  017712                                      ENDIF
5372  017712                                                              $50605:
5373  017712                                  ENDIF
5374  017712                                                              $50603:
5375  017712
5376  017712                                                              $50576:
5377  017712  005737  000514          IF DSLEN2 GT #0 AND DSLEN1 EQ #0 THEN       ;DST.LEN > 0, SRC.LEN = 0
5378  017716  003420                                                        TST     DSLEN2
5379  017720  005737  000512                                                BLE     $50606
5380  017724  001015                                                        TST     DSLEN1
5381  017726                                                                BNE     $50606
5382  017726  012701  062536              LET R1 :- #DS.EXP
                                                                            MOV     #DS.EXP,R1
```

```
5383  017732                          LET R2 := DSLEN2                                    MOV     DSLEN2,R2
5384  017732  013702  000514                                                            
5385  017736                          WHILE R2 HI #0 DO                                 $50607:
5386  017736                                                                              TST     R2
5387  017736  005702                                                                     BLOS    $50610
5388  017740  101404                    LET (R1)+ :B= #60                                MOVB    #60,(R1)+
5389  017742                                                                            
5390  017742  112721  000060            LET R2 := R2 - #1                                DEC     R2
5391  017746                                                                            
5392  017746  005302                  ENDDO                                             BR      $50607
5393  017750                                                                          $50610:
5394  017750  000772                                                                   
5395  017752                          LET CC.EXP := CC.EXP SET.BY #ZBIT                 BIS     #ZBIT,CC.EXP
5396  017752                                                                          
5397  017752  052737  000004  000520  ENDIF                                          $50606:
5398  017760                                                                          
5399  017760                          IF DSLEN2 GT #0 AND DSLEN1 GT #0 THEN     ;DST.LEN > 0 AND SRC.LEN > 0
5400  017760                                                                            TST     DSLEN2
5401  017760  005737  000514                                                           BLE     $50611
5402  017764  003565                                                                   TST     DSLEN1
5403  017766  005737  000512                                                           BLE     $50611
5404  017772  003562                                                                  
5405  017774                            LET R1 := #DSBUF1 + #10. - DSLEN1               MOV     #DSBUF1,R1
5406  017774  012701  062370                                                           ADD     #10.,R1
5407  020000  062701  000012                                                           SUB     DSLEN1,R1
5408  020004  163701  000512                                                          
5409  020010                            LET R2 := #DS.EXP                               MOV     #DS.EXP,R2
5410  020010  012702  062536                                                          
5411  020014                          IF DSLEN2 GT DSLEN1 THEN                  ;DST.LEN > SRC.LEN > 0
5412  020014  023737  000514  000512                                                   CMP     DSLEN2,DSLEN1
5413  020022  003413                                                                   BLE     $50612
5414  020024                                                                          
5415  020024  063702  000514            LET R2 := R2 + DSLEN2 - DSLEN1                  ADD     DSLEN2,R2
5416  020030  163702  000512                                                           SUB     DSLEN1,R2
5417  020034                                                                          
5418  020034  012700  062536            LET R0 := #DS.EXP                               MOV     #DS.EXP,R0
5419  020040                                                                          
5420  020040                            WHILE R0 NE R2 DO                             $50613:
5421  020040  020002                                                                   CMP     R0,R2
5422  020042  001403                                                                   BEQ     $50614
5423  020044                                                                          
5424  020044  112720  000060              LET (R0)+ :B= #60                           MOVB    #60,(R0)+
5425  020050                                                                          
5426  020050  000773                    ENDDO                                         BR      $50613
5427  020052                                                                        $50614:
5428  020052                          ENDIF                                           
5429  020052                                                                        $50612:
5430  020052                                                                          
5431  020052  023737  000514  000512  IF DSLEN2 LO DSLEN1 THEN                  ;SRC.LEN > DST.LEN > 0
5432  020060  103007                                                                   CMP     DSLEN2,DSLEN1
5433  020062                                                                          BHIS    $50615
5434  020062  063701  000512                                                          
5435  020066  163701  000514            LET R1 := R1 + DSLEN1 - DSLEN2                  ADD     DSLEN1,R1
5436  020072                                                                          SUB     DSLEN2,R1
5437  020072  052737  000002  000520                                                  
5438  020100                            LET CC.EXP :- CC.EXP SET.BY #VBIT               BIS     #VBIT,CC.EXP
                                      ENDIF
```

```
5439  020100                                  REPEAT                                          $50615:
5440  020100                                                                                  $50616:
5441  020100                                      LET TEMP0 :B= (R1)+ SET.BY #60      ;TRANSFER THE DIGITS TO DS.EXP
5442  020100                                                                                      MOVB    (R1)+,TEMP0
5443  020100  112137  000474                                                                     BISB    #60,TEMP0
5444  020104  152737  000060  000474
5445  020112                                      LET (R2)+ :B= TEMP0
5446  020112  113722  000474                                                                     MOVB    TEMP0,(R2)+
5447  020116                                  UNTIL R1 EQ #DSBUF1+12
5448  020116  020127  062402                                                                     CMP     R1,#DSBUF1+12
5449  020122  001366                                                                             BNE     $50616
5450  020124                                  IF DATTYP EQ #0 AND SIGN0 EQ #-1 THEN
5451  020124  005737  000462                                                                     TST     DATTYP
5452  020130  001012                                                                             BNE     $50617
5453  020132  023727  000446  177777                                                             CMP     SIGN0,#-1
5454  020140  001006                                                                             BNE     $50617
5455  020142
5456  020142  052737  000010  000520              LET CC.EXP := CC.EXP SET.BY #NBIT              BIS     #NBIT,CC.EXP
5457  020150
5458  020150  005302                              LET R2 := R2 - #1                              DEC     R2
5459  020152
5460  020152  152712  000160                      LET (R2) :B= (R2) SET.BY #160          ;*** SIGNED ZONE, NEGATIVE ***
5461  020156                                                                                      BISB    #160,(R2)
5462  020156                                  ENDIF                                           $50617:
5463  020156                                  IF DATTYP EQ #20000 OR DATTYP EQ #30000 THEN        ;*** OVERPUNCH ***
5464  020156  023727  000462  020000                                                                 CMP     DATTYP,#20000
5465  020164  001404                                                                                 BEQ     $50620
5466  020166  023727  000462  030000                                                                 CMP     DATTYP,#30000
5467  020174  001026                                                                                 BNE     $50621
5468  020176                                                                                  $50620:
5469  020176                                      IF DATTYP EQ #20000 THEN                        ;TRAILING
5470  020176  023727  000462  020000                                                                 CMP     DATTYP,#20000
5471  020204  001002                                                                                 BNE     $50622
5472  020206
5473  020206  005302                                  LET R2 := R2 - #1                          DEC     R2
5474  020210                                                                                      ;LEADING
5475  020210  000402                              ELSE                                           BR      $50623
5476  020212                                                                                  $50622:
5477  020212
5478  020212  012702  062536                          LET R2 := #DS.EXP                          MOV     #DS.EXP,R2
5479  020216                                      ENDIF                                       $50623:
5480  020216
5481  020216                                      LET R0 :B- (R2) CLR.BY #60                      MOVB    (R2),R0
5482  020216  111200                                                                             BICB    #60,R0
5483  020220  142700  000060                      IF SIGN0 EQ #-1 THEN                           ;NEG. SIGN
5484  020224                                                                                      CMP     SIGN0,#-1
5485  020224  023727  000446  177777                  LET R0 := R0 + #10.                        BNE     $50624
5486  020232  001005
5487  020234                                          LET CC.EXP := CC.EXP SET.BY #NBIT          ADD     #10.,R0
5488  020234  062700  000012                      ENDIF
5489  020240                                                                                      BIS     #NBIT,CC.EXP
5490  020240  052737  000010  000520              LET (R2) :B= OVPNCH(R0)                     $50624:
5491  020246                                                                                  ;GET APPROPRIATE SIGN/DIGIT FROM
5492  020246                                                                                      MOVB    OVPNCH(R0),(R2)
5493  020246
5494  020246  116012  055254
```

```
5495  020252
5496  020252
5497  020252
5498  020252  023727  000462  040000
5499  020260  001404
5500  020262  023727  000462  050000
5501  020270  001023
5502  020272
5503  020272
5504  020272  023727  000462  050000
5505  020300  001003
5506  020302
5507  020302  012702  062536
5508  020306  005302
5509  020310
5510  020310
5511  020310
5512  020310  023727  000446  177777
5513  020316  001006
5514  020320
5515  020320  112712  000055
5516  020324
5517  020324  052737  000010  000520
5518  020332
5519  020332  000402
5520  020334
5521  020334
5522  020334  112712  000053
5523  020340
5524  020340
5525  020340
5526  020340
5527  020340
5528  020340
5529
5530
5531
5532
5533
5534  020340
5535  020340  013700  000560
5536  020344
5537  020344  012701  062474
5538  020350
5539  020350  013702  000562
5540  020354
5541  020354  013703  000564
5542  020360
5543  020360  032737  000001  000466
5544  020366  001405
5545  020370
5546  020370  012704  177777
5547  020374
5548  020374  012705  177777
5549  020400
5550  020400  000402
```

```
ENDIF

IF DATTYP EQ #40000 OR DATTYP EQ #50000 THEN



    IF DATTYP EQ #50000 THEN

        LET R2 := #DS.EXP - #1

    ENDIF

    IF SIGNO EQ #-1 THEN

        LET (R2) :B= #55

        LET CC.EXP := CC.EXP SET.BY #NBIT

    ELSE

        LET (R2) :B= #53

    ENDIF

ENDIF

;+
; SET UP GPR'S AND EXPECTED GPR'S.
;-

LET R0 := DATA00                ;DATA TYPE AND LENGTH
LET R1 := #DS.DST               ;DST. ADR
LET R2 := DATA01
LET R3 := DATA02
IF #1 SETIN COUNT THEN

    LET R4 := #177777

    LET R5 :- #177777

ELSE
```

```
$50621:
    ;*** SEPARATE ***
        CMP     DATTYP,#40000
        BEQ     $50625
        CMP     DATTYP,#50000
        BNE     $50626
$50625:
        ;LEADING
        CMP     DATTYP,#50000
        BNE     $50627

        MOV     #DS.EXP,R2
        DEC     R2
$50627:

        CMP     SIGNO,#-1
        BNE     $50630
        ;NEGATIVE
        MOVB    #55,(R2)

        BIS     #NBIT,CC.EXP

        BR      $50631
$50630:
        ;POSITIVE
        MOVB    #53,(R2)

$50631:

$50626:

$50611:


        MOV     DATA00,R0
        MOV     #DS.DST,R1
        MOV     DATA01,R2
        MOV     DATA02,R3
        BIT     #1,COUNT
        BEQ     $50632
        MOV     #177777,R4
        MOV     #177777,R5
        BR      $50633
```

```
5551  020402                                                        $50632:
5552  020402                          LET R4 := #0
5553  020402  005004                                                        CLR     R4
5554  020404                          LET R5 := #0
5555  020404  005005                                                        CLR     R5
5556  020406                        ENDIF
5557  020406                                                        $50633:
5558  020406                        LET R0.EXP := R0
5559  020406  010037  000522                                               MOV     R0,R0.EXP
5560  020412                        LET R1.EXP := R1
5561  020412  010137  000524                                               MOV     R1,R1.EXP
5562  020416                        LET R2.EXP := #0
5563  020416  005037  000526                                               CLR     R2.EXP
5564  020422                        LET R3.EXP := #0
5565  020422  005037  000530                                               CLR     R3.EXP
5566  020426                        LET R4.EXP := R4
5567  020426  010437  000532                                               MOV     R4,R4.EXP
5568  020432                        LET R5.EXP := R5
5569  020432  010537  000534                                               MOV     R5,R5.EXP
5570
5571                                ;+
5572                                ; DO THE CIS INSTRUCTION
5573                                ;-
5574
5575  020436                        INLINE <CVTLN>
5576  020436  076057                                                        CVTLN
5577
5578
5579                                ;+
5580                                ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
5581                                ;-
5582
5583  020440                        LET CC := PSW
5584  020440  013737  177776  000516                                       MOV     PSW,CC
5585  020446                        LET CC := CC CLR.BY #177760
5586  020446  042737  177760  000516                                       BIC     #177760,CC
5587  020454                        IF CC NE CC.EXP THEN
5588  020454  023737  000516  000520                                       CMP     CC,CC.EXP
5589  020462  001402                                                       BEQ     $50634
5590  020464                          CALL ERROR
5591  020464  004737  056274                                               JSR     PC,ERROR
5592  020470                        ENDIF
5593  020470                                                        $50634:
5594  020470                        IF R0 NE R0.EXP THEN
5595  020470  020037  000522                                               CMP     R0,R0.EXP
5596  020474  001402                                                       BEQ     $50635
5597  020476                          CALL ERROR
5598  020476  004737  056274                                               JSR     PC,ERROR
5599  020502                        ENDIF
5600  020502                                                        $50635:
5601  020502                        IF R1 NE R1.EXP THEN
5602  020502  020137  000524                                               CMP     R1,R1.EXP
5603  020506  001402                                                       BEQ     $50636
5604  020510                          CALL ERROR
5605  020510  004737  056274                                               JSR     PC,ERROR
5606  020514                        ENDIF
```

```
 5607  020514                                                                $50636:
 5608  020514                          IF R2 NE R2.EXP THEN
 5609  020514  020237  000526                                                        CMP     R2,R2.EXP
 5610  020520  001402                                                                BEQ     $50637
 5611  020522                            CALL ERROR
 5612  020522  004737  056274                                                        JSR     PC,ERROR
 5613  020526                          ENDIF
 5614  020526                                                                $50637:
 5615  020526                          IF R3 NE R3.EXP THEN
 5616  020526  020337  000530                                                        CMP     R3,R3.EXP
 5617  020532  001402                                                                BEQ     $50640
 5618  020534                            CALL ERROR
 5619  020534  004737  056274                                                        JSR     PC,ERROR
 5620  020540                          ENDIF
 5621  020540                                                                $50640:
 5622  020540                          IF R4 NE R4.EXP THEN
 5623  020540  020437  000532                                                        CMP     R4,R4.EXP
 5624  020544  001402                                                                BEQ     $50641
 5625  020546                            CALL ERROR
 5626  020546  004737  056274                                                        JSR     PC,ERROR
 5627  020552                          ENDIF
 5628  020552                                                                $50641:
 5629  020552                          IF R5 NE R5.EXP THEN
 5630  020552  020537  000534                                                        CMP     R5,R5.EXP
 5631  020556  001402                                                                BEQ     $50642
 5632  020560                            CALL ERROR
 5633  020560  004737  056274                                                        JSR     PC,ERROR
 5634  020564                          ENDIF
 5635  020564                                                                $50642:
 5636
 5637                                  ;+
 5638                                  ; COMPARE THE EXPECTED DECIMAL STRING BUFFER
 5639                                  ; WITH ACTUAL RESULTS.
 5640                                  ;-
 5641
 5642  020564                          LET R0 :- #DS.DST
 5643  020564  012700  062474                                                        MOV     #DS.DST,R0
 5644  020570                          LET R1 := #DS.EXP
 5645  020570  012701  062536                                                        MOV     #DS.EXP,R1
 5646  020574                          LET ERRFLG := #0
 5647  020574  005037  000454                                                        CLR     ERRFLG
 5648  020600                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
 5649  020600                                                                $50643:
 5650  020600  020027  062534                                                        CMP     R0,#DS.DST+40
 5651  020604  001410                                                                BEQ     $50644
 5652  020606  005737  000454                                                        TST     ERRFLG
 5653  020612  001005                                                                BNE     $50644
 5654  020614                              IFB (R0)+ NE (R1)+ THEN
 5655  020614  122021                                                                CMPB    (R0)+,(R1)+
 5656  020616  001402                                                                BEQ     $50645
 5657  020620                                CALL ERROR
 5658  020620  004737  056274                                                        JSR     PC,ERROR
 5659  020624                              ENDIF
 5660  020624                                                                $50645:
 5661  020624                          ENDDO
 5662  020624  000765                                                                BR      $50643
```

```
5663  020626                                  
5664  020626                                  
5665  020626  062737  000006  000542            LET TSTCAS := TSTCAS + #6
5666  020634                                  
5667  020634  005337  000466                    LET COUNT := COUNT - #1
5668                                          ;UNTIL COUNT EQ #0
5669  020640                                  IF COUNT NE #0 THEN
5670  020640  005737  000466                  
5671  020644  001402                            
5672  020646                                      INLINE <JMP $5057>
5673  020646  000137  017462                  
5674  020652                                  ENDIF
5675  020652                                  
5676                                          
5677                                          ;+
5678                                          ; DO ONE IN-LINE CASE - CVTLNI
5679                                          ;-
5680                                          
5681  020652                                  CALL CLRREG
5682  020652  004737  055330                  CALL CLRDSB
5683  020656                                  
5684  020656  004737  055520                  INLINE <CVTLNI>
5685  020662                                  
5686  020662  076157                          INLINE  <.WORD  TCVLNI>
5687  020664                                  
5688  020664  021164                          INLINE  <.WORD  TCVLNI+4>
5689  020666                                  
5690  020666  021170                          LET CC := PSW
5691  020670                                  
5692  020670  013737  177776  000516          LET CC := CC CLR.BY #177760
5693  020676                                  
5694  020676  042737  177760  000516          IF CC NE #0 THEN
5695  020704                                  
5696  020704  005737  000516                  
5697  020710  001402                            
5698  020712                                      CALL ERROR
5699  020712  004737  056274                  
5700  020716                                  ENDIF
5701  020716                                  
5702  020716                                  IF R0 NE #0 THEN
5703  020716  005700                          
5704  020720  001402                            
5705  020722                                      CALL ERROR
5706  020722  004737  056274                  
5707  020726                                  ENDIF
5708  020726                                  
5709  020726                                  IF R1 NE #0 THEN
5710  020726  005701                          
5711  020730  001402                            
5712  020732                                      CALL ERROR
5713  020732  004737  056274                  
5714  020736                                  ENDIF
5715  020736                                  
5716  020736                                  IF R2 NE #0 THEN
5717  020736  005702                          
5718  020740  001402                            
```

```
$50644:
        ADD     #6,TSTCAS
        DEC     COUNT

        TST     COUNT
        BEQ     $50646

        JMP $5057
$50646:



        JSR     PC,CLRREG
        JSR     PC,CLRDSB
        CVTLNI
        .WORD   TCVLNI
        .WORD   TCVLNI+4
        MOV     PSW,CC
        BIC     #177760,CC
        TST     CC
        BEQ     $50647
        JSR     PC,ERROR
$50647:
        TST     R0
        BEQ     $50650
        JSR     PC,ERROR
$50650:
        TST     R1
        BEQ     $50651
        JSR     PC,ERROR
$50651:
        TST     R2
        BEQ     $50652
```

```
5719  020742
5720  020742  004737  056274                  CALL ERROR                          JSR     PC,ERROR
5721  020746                                  ENDIF
5722  020746                                                                  $50652:
5723  020746                                  IF R3 NE #0 THEN                    TST     R3
5724  020746  005703                                                            BEQ     $50653
5725  020750  001402
5726  020752                                                                      JSR     PC,ERROR
5727  020752  004737  056274                  CALL ERROR                      $50653:
5728  020756                                  ENDIF
5729  020756                                                                      TST     R4
5730  020756                                  IF R4 NE #0 THEN                    BEQ     $50654
5731  020756  005704
5732  020760  001402                                                            JSR     PC,ERROR
5733  020762                                                                  $50654:
5734  020762  004737  056274                  CALL ERROR
5735  020766                                  ENDIF                               TST     R5
5736  020766                                                                      BEQ     $50655
5737  020766                                  IF R5 NE #0 THEN
5738  020766  005705                                                            JSR     PC,ERROR
5739  020770  001402                                                        $50655:
5740  020772
5741  020772  004737  056274                  CALL ERROR                          MOV     #DS.DST-1,R0
5742  020776                                  ENDIF
5743  020776                                                                      CMPB    (R0)+,#53
5744  020776                                  LET R0 := #DS.DST-1                 BEQ     $50656
5745  020776  012700  062473
5746  021002                                  IFB (R0)+ NE #53 THEN               JSR     PC,ERROR
5747  021002  122027  000053                                                $50656:
5748  021006  001402
5749  021010                                    CALL ERROR                        CLR     ERRFLG
5750  021010  004737  056274                 ENDIF                          $50657:
5751  021014
5752  021014                                  LET ERRFLG := #0                    CMPB    (R0)+,#61
5753  021014                                                                      BEQ     $50660
5754  021014  005037  000454                 REPEAT
5755  021020                                                                      JSR     PC,ERROR
5756  021020                                    IFB (R0)+ NE #61 THEN         $50660:
5757  021020
5758  021020  122027  000061                                                      CMP     R0,#DS.DST+12
5759  021024  001402                             CALL ERROR                        BEQ     $50661
5760  021026                                    ENDIF                             TST     ERRFLG
5761  021026  004737  056274                                                      BEQ     $50657
5762  021032                                  UNTIL R0 EQ #DS.DST+12 OR ERRFLG NE #0
5763  021032                                                                  $50661:
5764  021032
5765  021032  020027  062506                                                      JMP XCVTPL
5766  021036  001403
5767  021040  005737  000454
5768  021044  001765
5769  021046
5770  021046                                  INLINE  <JMP XCVTPL>
5771  021046  000137  021174
5772
5773
5774                                          ;+
```

```
                                ; TABLE OF TEST CASES FOR CVTLN
                                ;-

021052  000014          TCVTLN: .WORD   12.             ;# OF TEST CASES FOR CVTLN

021054  000005                  .WORD   5                       ;DST. DATA TYPE AND LENGTH
021056  000000                  .WORD   0                       ;LONG INTEGER HIGH & SIGN
021060  000000                  .WORD   0                       ;LONG INTEGER LOW

021062  050006                  .WORD   50006           ;TEST CASE NUMBER 2
021064  000000                  .WORD   0
021066  000000                  .WORD   0

021070  020010                  .WORD   20010           ;TEST CASE NUMBER 3
021072  000000                  .WORD   0
021074  001751                  .WORD   1751

021076  030000                  .WORD   30000           ;TEST CASE NUMBER 4
021100  000000                  .WORD   0
021102  152361                  .WORD   152361

021104  040000                  .WORD   40000           ;TEST CASE NUMBER 5
021106  000000                  .WORD   0
021110  024137                  .WORD   24137

021112  050003                  .WORD   50003           ;TEST CASE NUMBER 6
021114  000000                  .WORD   0
021116  075147                  .WORD   75147

021120  020004                  .WORD   20004           ;TEST CASE NUMBER 7
021122  000000                  .WORD   0
021124  075147                  .WORD   75147

021126  000012                  .WORD   12              ;TEST CASE NUMBER 8
021130  077777                  .WORD   77777
021132  177777                  .WORD   177777

021134  000037                  .WORD   37              ;TEST CASE NUMBER 9
021136  100000                  .WORD   100000
021140  000000                  .WORD   0

021142  010021                  .WORD   10021           ;TEST CASE NUMBER 10
021144  100000                  .WORD   100000
021146  000000                  .WORD   0

021150  040012                  .WORD   40012           ;TEST CASE NUMBER 11
021152  074377                  .WORD   74377
021154  171700                  .WORD   171700

021156  030000                  .WORD   30000           ;TEST CASE NUMBER 12
021160  000000                  .WORD   0
021162  000000                  .WORD   0


021164          TCVLNI:                         ;IN-LINE TEST CASE
021164  050012          .WORD   50012                   ;DST TYPE = LEADING SEPARATE, LENGTH = 12
```

```
 5831  021166  062474                          .WORD   DS.DST          ;DST.ADDRESS
 5832  021170  032707                          .WORD   32707           ;LONG INTEGER LOW WORD +
 5833  021172  041072                          .WORD   41072           ;  LONG INTEGER HIGH WORD AND SIGN
 5834                                                                  ;  = 1111111111 IN BCD
```

```
                                        .SBTTL  CVTPL
                                        ;*****************************************************************
                                        ;
                                        ;  CVTPL TEST
                                        ;
                                        ;*****************************************************************
                                        INLINE  <XCVTPL:>
                                                                                                XCVTPL:
                                        INLINE  <SCOPE>
                                                                                                SCOPE
                                        LET $TIMES := #20                       ;ITERATION COUNT
                                                                                                MOV     #20,$TIMES
                                        LET COUNT := TCVTPL                     ;GET TEST COUNT
                                                                                                MOV     TCVTPL,COUNT
                                        LET TSTCAS := #TCVTPL+2         ;POINT TO FIRST TEST CASE
                                                                                                MOV     #TCVTPL+2,TSTCAS
                                        ;REPEAT
                                        INLINE  <$5073:>
                                                                                                $5073:
                                           ;+
                                           ; GET TEST DATA FROM TABLE
                                           ;-
                                           LET R0 := TSTCAS
                                                                                                MOV     TSTCAS,R0
                                           LET DATA00 := (R0)+                  ;SRC. DATA TYPE AND LENGTH
                                                                                                MOV     (R0)+,DATA00
                                           LET DATA01 := (R0)                   ;SRC. POINTER
                                                                                                MOV     (R0),DATA01
                                           ;+
                                           ; SET UP R0.EXP, R1.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                           ;-
                                           LET R0.EXP := #0
                                                                                                CLR     R0.EXP
                                           LET R1.EXP :- #0
                                                                                                CLR     R1.EXP
                                           IF #1 SETIN COUNT THEN
                                                                                                BIT     #1,COUNT
                                                                                                BEQ     $50662
                                              LET R4 :  #177777
                                                                                                MOV     #177777,R4
                                              LET R5 :- #177777
                                                                                                MOV     #177777,R5
                                           ELSE
                                                                                                BR      $50663
                                                                                        $50662:
                                              LET R4 :- #0
                                                                                                CLR     R4
                                              LET R5 :- #0
                                                                                                CLR     R5
                                           ENDIF
                                                                                        $50663:
                                           LET R4.EXP :  R4
```

```
5891  021272  010437  000532                                                    MOV     R4,R4.EXP
5892  021276                        LET R5.EXP := R5
5893  021276  010537  000534                                                    MOV     R5,R5.EXP
5894
5895                                ;+
5896                                ; CONVERT PACKED NUMBER AND LOAD INTO R2.EXP AND R3.EXP
5897                                ;-
5898
5899  021302                        CALL  CLRDSB
5900  021302  004737  055520                                                    JSR     PC,CLRDSB
5901  021306                        LET CC.EXP := #0
5902  021306  005037  000520                                                    CLR     CC.EXP
5903  021312                        LET R0 := #DSBUF1                 ;DST.POINTER
5904  021312  012700  062370                                                    MOV     #DSBUF1,R0
5905  021316                        LET R1 := DATA01                  ;SRC.POINTER
5906  021316  013701  000562                                                    MOV     DATA01,R1
5907  021322                        LET DSLEN1 := DATA00 CLR.BY #177740          ;GET SRC.LEN
5908  021322  013737  000560  000512                                           MOV     DATA00,DSLEN1
5909  021330  042737  177740  000512                                           BIC     #177740,DSLEN1
5910  021336                        IF DSLEN1 EQ #0 THEN              ;SRC.LEN-0
5911  021336  005737  000512                                                    TST     DSLEN1
5912  021342  001010                                                           BNE     $50664
5913  021344                           LET CC.EXP := CC.EXP SET.BY #ZBIT
5914  021344  052737  000004  000520                                           BIS     #ZBIT,CC.EXP
5915  021352                           LET R2.EXP := #0
5916  021352  005037  000526                                                    CLR     R2.EXP
5917  021356                           LET R3.EXP := #0
5918  021356  005037  000530                                                    CLR     R3.EXP
5919  021362                        ELSE
5920  021362  000532                                                           BR      $50665
5921  021364                                                          $50664:
5922  021364                           LET R0 :- #DSBUF1 + #10. - DSLEN1 ;DEST. FOR INTERMEDIATE RESULTS
5923  021364  012700  062370                                                    MOV     #DSBUF1,R0
5924  021370  062700  000012                                                    ADD     #10.,R0
5925  021374  163700  000512                                                    SUB     DSLEN1,R0
5926                                ;LOAD UP DSBUF1 BUFFER WITH INTERMEDIATE RESULTS
5927  021400                        CALL CLRDSB                       ;CLEAR DECIMAL STRING BUFFERS
5928  021400  004737  055520                                                    JSR     PC,CLRDSB
5929  021404                        IF #1 NOTSETIN DSLEN1 THEN
5930  021404  032737  000001  000512                                           BIT     #1,DSLEN1
5931  021412  001005                                                           BNE     $50666
5932  021414                           LET (R1) :B= (R1) CLR.BY #360  ;CLEAR UPPER NIBBLE
5933  021414  142711  000360                                                    BICB    #360,(R1)
5934  021420                           LET (R0)+ :B= (R1)+
5935  021420  112120                                                           MOVB    (R1)+,(R0)+
5936  021422                           LET DSLEN1 := DSLEN1 - #1
5937  021422  005337  000512                                                    DEC     DSLEN1
5938  021426                        ENDIF
5939  021426                                                          $50666:
5940  021426                        WHILE DSLEN1 HI #1 DO
5941  021426                                                          $50667:
5942  021426  023727  000512  000001                                           CMP     DSLEN1,#1
5943  021434  101420                                                           BLOS    $50670
5944  021436                           LET (R0) :B= (R1)
5945  021436  111110                                                           MOVB    (R1),(R0)
5946  021440                           INLINE <ASRB (R0)>
```

```
5947  021440  106210                          INLINE <ASRB (R0)>                          ASRB (R0)
5948  021442                                                                              ASRB (R0)
5949  021442  106210                          INLINE <ASRB (R0)>                          ASRB (R0)
5950  021444                                                                              ASRB (R0)
5951  021444  106210                          INLINE <ASRB (R0)>                          ASRB (R0)
5952  021446                                                                              ASRB (R0)
5953  021446  106210                          LET (R0) :B= (R0) CLR.BY #360   ;CLEAR UPPER NIBBLE
5954  021450                                                                      BICB    #360,(R0)
5955  021450  142710  000360                  LET R0 := R0 + #1                           INC     R0
5956  021454                                                                      MOVB    (R1)+,(R0)
5957  021454  005200                          LET (R0) :B= (R1)+ CLR.BY #360      BICB    #360,(R0)
5958  021456                                                                      INC     R0
5959  021456  112110                          LET R0 := R0 + #1                           SUB     #2,DSLEN1
5960  021460  142710  000360                  LET DSLEN1 := DSLEN1 - #2                   BR      $50667
5961  021464                                 ENDDO                                $50670:
5962  021464  005200                                                     ;GET THE LSD
5963  021466                                 LET (R0) :B= (R1)                           MOVB    (R1),(R0)
5964  021466  162737  000002  000512          INLINE <ASRB (R0)>                          ASRB (R0)
5965  021474                                                                              ASRB (R0)
5966  021474  000754                          INLINE <ASRB (R0)>                          ASRB (R0)
5967  021476                                                                              ASRB (R0)
5968  021476                                 LET (R0) :B= (R0) CLR.BY #360               BICB    #360,(R0)
5969  021476  111110
5970  021500                                 ;LOAD UP R2.EXP AND R3.EXP WITH FINAL RESULT
5971  021500  106210                          CALL CVTIL                                  JSR     PC,CVTIL
5972  021502
5973  021502  106210                          LET DATTYP :  DATA00 CLR.BY #107777         MOV     DATA00,DATTYP
5974  021504                                                                      BIC     #107777,DATTYP
5975  021504  106210
5976  021506                                 IF DATTYP EQ #60000 THEN        ;SIGNED PACKED
5977  021506  106210                                                             CMP     DATTYP,#60000
5978  021510                                                                      BNE     $50671
5979  021510  142710  000360                    LET TEMP5 :B- (R1) CLR.BY #360  ;ISOLATE THE SIGN
5980                                                                              MOVB    (R1),TEMP5
5981  021514                                                                      BICB    #360,TEMP5
5982  021514  004737  031266                    IFB TEMP5 EQ #15 OR TEMP5 EQ #13 THEN
5983  021520                                                                      CMPB    TEMP5,#15
5984  021520  013737  000560  000462                                             BEQ     $50672
5985  021526  042737  107777  000462                                             CMP     TEMP5,#13
5986  021534                                                                      BNE     $50673
5987  021534  023727  000462  060000                                       $50672:
5988  021542  001042                              LET CC.EXP := CC.EXP SET.BY #NBIT
5989  021544                                                                      BIS     #NBIT,CC.EXP
5990  021544  111137  000506                      LET R3.EXP := NEGATE R3.EXP
5991  021550  142737  000360  000506                                             NEG     R3.EXP
5992  021556                                       LET R2.EXP :- COMP R2.EXP
5993  021556  123727  000506  000015
5994  021564  001404
5995  021566  023727  000506  000013
5996  021574  001025
5997  021576
5998  021576
5999  021576  052737  000010  000520
6000  021604
6001  021604  005437  000530
6002  021610
```

```
6003  021610  005137  000526                                                          COM     R2.EXP
6004  021614                                  IF R3.EXP EQ #0 THEN
6005  021614  005737  000530                                                          TST     R3.EXP
6006  021620  001002                                                                  BNE     $50674
6007  021622                                     LET R2.EXP := R2.EXP + #1
6008  021622  005237  000526                                                          INC     R2.EXP
6009  021626                                  ENDIF
6010  021626                                                                  $50674:
6011  021626                                  IF R2.EXP NE #0 OR R3.EXP NE #0 THEN
6012  021626  005737  000526                                                          TST     R2.EXP
6013  021632  001003                                                                  BNE     $50675
6014  021634  005737  000530                                                          TST     R3.EXP
6015  021640  001403                                                                  BEQ     $50676
6016  021642                                                                  $50675:
6017  021642                                     LET CC.EXP := CC.EXP SET.BY #CBIT
6018  021642  052737  000001  000520                                                  BIS     #CBIT,CC.EXP
6019  021650                                  ENDIF
6020  021650                                                                  $50676:
6021  021650                                ENDIF
6022  021650                                                                  $50673:
6023  021650                             ENDIF
6024  021650                                                                  $50671:
6025  021650                          ENDIF
6026  021650                                                                  $50665:
6027
6028                                    ;+
6029                                    ; SET UP R0 THRU R3
6030                                    ;-
6031
6032  021650                            LET R0 := DATA00              ;SRC.DSCR
6033  021650  013700  000560                                                  MOV     DATA00,R0
6034  021654                            LET R1 := DATA01              ;SRC.DSCR
6035  021654  013701  000562                                                  MOV     DATA01,R1
6036  021660                            LET R2 := #0
6037  021660  005002                                                          CLR     R2
6038  021662                            LET R3 := #0
6039  021662  005003                                                          CLR     R3
6040
6041                                    ;+
6042                                    ; DO THE CIS INSTRUCTION
6043                                    ;-
6044
6045  021664                            INLINE <CVTPL>
6046  021664  076073                                                          CVTPL
6047
6048
6049                                     ;+
6050                                     ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
6051                                     ;-
6052
6053  021666                             LET CC := PSW
6054  021666  013737  177776  000516                                          MOV     PSW,CC
6055  021674                             LET CC := CC CLR.BY #177760
6056  021674  042737  177760  000516                                          BIC     #177760,CC
6057  021702                             IF CC NE CC.EXP THEN
6058  021702  023737  000516  000520                                          CMP     CC,CC.EXP
```

```
6059  021710  001402                                                        BEQ     $50677
6060  021712
6061  021712  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6062  021716                                  ENDIF
6063  021716                                                          $50677:
6064  021716                                  IF R0 NE R0.EXP THEN
6065  021716  020037  000522                                                CMP     R0,R0.EXP
6066  021722  001402                                                        BEQ     $50700
6067  021724
6068  021724  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6069  021730                                  ENDIF
6070  021730                                                          $50700:
6071  021730                                  IF R1 NE R1.EXP THEN
6072  021730  020137  000524                                                CMP     R1,R1.EXP
6073  021734  001402                                                        BEQ     $50701
6074  021736
6075  021736  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6076  021742                                  ENDIF
6077  021742                                                          $50701:
6078  021742                                  IF R2 NE R2.EXP THEN
6079  021742  020237  000526                                                CMP     R2,R2.EXP
6080  021746  001402                                                        BEQ     $50702
6081  021750
6082  021750  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6083  021754                                  ENDIF
6084  021754                                                          $50702:
6085  021754                                  IF R3 NE R3.EXP THEN
6086  021754  020337  000530                                                CMP     R3,R3.EXP
6087  021760  001402                                                        BEQ     $50703
6088  021762
6089  021762  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6090  021766                                  ENDIF
6091  021766                                                          $50703:
6092  021766                                  IF R4 NE R4.EXP THEN
6093  021766  020437  000532                                                CMP     R4,R4.EXP
6094  021772  001402                                                        BEQ     $50704
6095  021774
6096  021774  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6097  022000                                  ENDIF
6098  022000                                                          $50704:
6099  022000                                  IF R5 NE R5.EXP THEN
6100  022000  020537  000534                                                CMP     R5,R5.EXP
6101  022004  001402                                                        BEQ     $50705
6102  022006
6103  022006  004737  056274                    CALL ERROR                  JSR     PC,ERROR
6104  022012                                  ENDIF
6105  022012                                                          $50705:
6106
6107  022012                                    LET TSTCAS := TSTCAS + #4
6108  022012  062737  000004  000542                                        ADD     #4,TSTCAS
6109  022020                                    LET COUNT := COUNT - #1
6110  022020  005337  000466                                                DEC     COUNT
6111                                        ;UNTIL COUNT EQ #0
6112  022024                                IF COUNT NE #0 THEN
6113  022024  005737  000466                                                TST     COUNT
6114  022030  001402                                                        BEQ     $50706
```

```
 6115  022032                          INLINE <JMP $5073>                                  JMP $5073
 6116  022032  000137  021220
 6117  022036                        ENDIF
 6118  022036                                                                          $50706:
 6119
 6120                                ;+
 6121                                ; DO ONE INLINE CASE - CVTPLI
 6122                                ;-
 6123  022036                        CALL CLRREG                                         JSR     PC,CLRREG
 6124  022036  004737  055330
 6125  022042                        CALL CLRDSB                                         JSR     PC,CLRDSB
 6126  022042  004737  055520
 6127  022046                        INLINE <CVTPLI>                                     CVTPLI
 6128  022046  076173
 6129  022050                        INLINE  <.WORD  TCVPLI>                             .WORD   TCVPLI
 6130  022050  022274
 6131  022052                        INLINE  <.WORD  TCVPLI+4>                           .WORD   TCVPLI+4
 6132  022052  022300
 6133  022054                        LET CC := PSW                                       MOV     PSW,CC
 6134  022054  013737  177776  000516
 6135  022062                        LET CC := CC CLR.BY #177760                         BIC     #177760,CC
 6136  022062  042737  177760  000516
 6137  022070                        IF CC NE #0 THEN                                    TST     CC
 6138  022070  005737  000516                                                          BEQ     $50707
 6139  022074  001402
 6140  022076                           CALL ERROR                                       JSR     PC,ERROR
 6141  022076  004737  056274
 6142  022102                        ENDIF                                           $50707:
 6143  022102
 6144  022102                        IF R0 NE #0 THEN                                    TST     R0
 6145  022102  005700                                                                   BEQ     $50710
 6146  022104  001402
 6147  022106                           CALL ERROR                                       JSR     PC,ERROR
 6148  022106  004737  056274
 6149  022112                        ENDIF                                           $50710:
 6150  022112
 6151  022112                        IF R1 NE #0 THEN                                    TST     R1
 6152  022112  005701                                                                   BEQ     $50711
 6153  022114  001402
 6154  022116                           CALL ERROR                                       JSR     PC,ERROR
 6155  022116  004737  056274
 6156  022122                        ENDIF                                           $50711:
 6157  022122
 6158  022122                        IF R2 NE #0 THEN                                    TST     R2
 6159  022122  005702                                                                   BEQ     $50712
 6160  022124  001402
 6161  022126                           CALL ERROR                                       JSR     PC,ERROR
 6162  022126  004737  056274
 6163  022132                        ENDIF                                           $50712:
 6164  022132
 6165  022132                        IF R3 NE #0 THEN                                    TST     R3
 6166  022132  005703                                                                   BEQ     $50713
 6167  022134  001402
 6168  022136                           CALL ERROR                                       JSR     PC,ERROR
 6169  022136  004737  056274
 6170  022142                        ENDIF
```

```
6171  022142                          IF R4 NE #0 THEN
6172  022142
6173  022142  005704                                                  $50713:
6174  022144  001402                                                          TST     R4
6175  022146                             CALL ERROR                            BEQ     $50714
6176  022146  004737  056274                                                  JSR     PC,ERROR
6177  022152                          ENDIF
6178  022152                                                          $50714:
6179  022152                          IF R5 NE #0 THEN
6180  022152  005705                                                          TST     R5
6181  022154  001402                                                          BEQ     $50715
6182  022156                             CALL ERROR                            JSR     PC,ERROR
6183  022156  004737  056274
6184  022162                          ENDIF                           $50715:
6185  022162
6186  022162                          IF TCVPLI+4 NE #32707 THEN              CMP     TCVPLI+4,#32707
6187  022162  023727  022300  032707                                          BEQ     $50716
6188  022170  001402                                                          JSR     PC,ERROR
6189  022172                             CALL ERROR
6190  022172  004737  056274                                        $50716:
6191  022176                          ENDIF
6192  022176                                                                  CMP     TCVPLI+6,#41072
6193  022176                          IF TCVPLI+6 NE #41072 THEN              BEQ     $50717
6194  022176  023727  022302  041072                                          JSR     PC,ERROR
6195  022204  001402
6196  022206                             CALL ERROR                   $50717:
6197  022206  004737  056274
6198  022212                          ENDIF                                   JMP XCVTNL
6199  022212
6200  022212                          INLINE  <JMP XCVTNL>
6201  022212  000137  022314
6202
6203
6204
6205                                ;+
6206                                ; TABLE OF TEST CASES FOR CVTPL
6207                                ;-
6208
6209  022216  000006                TCVTPL: .WORD   6               ;# OF TEST CASES FOR CVTPL
6210
6211  022220  060000                        .WORD   60000                   ;SRC. DATA TYPE AND LENGTH
6212  022222  022250                        .WORD   CVTPL1                  ;POINTER TO PACKED DECIMAL STRING
6213
6214  022224  060004                        .WORD   60004           ;TEST CASE NUMBER 2
6215  022226  022251                        .WORD   CVTPL2
6216
6217  022230  060004                        .WORD   60004           ;TEST CASE NUMBER 3
6218  022232  022254                        .WORD   CVTPL3
6219
6220  022234  060012                        .WORD   60012           ;TEST CASE NUMBER 4
6221  022236  022257                        .WORD   CVTPL4
6222
6223  022240  070007                        .WORD   70007           ;TEST CASE NUMBER 5
6224  022242  022265                        .WORD   CVTPL5
6225
6226  022244  060005                        .WORD   60005           ;TEST CASE NUMBER 6
```

```
 6227  022246  022271                          .WORD   CVTPL6
 6228
 6229
 6230  022250     014                CVTPL1:  .BYTE   014                          ;PACKED DECIMAL STRING 1
 6231
 6232  022251     001     043     114 CVTPL2:  .BYTE   001,043,114                  ;PACKED DECIMAL STRING 2
 6233
 6234  022254     001     043     115 CVTPL3:  .BYTE   001,043,115                  ;PACKED DECIMAL STRING 3
 6235
 6236  022257     002     024     164 CVTPL4:  .BYTE   002,024,164,203,144,174      ;PACKED DECIMAL STRING 4
 6237  022262     203     144     174
 6238
 6239  022265     022     000     007 CVTPL5:  .BYTE   022,000,007,055              ;PACKED DECIMAL STRING 5
 6240  022270     055
 6241
 6242  022271     061     040     174 CVTPL6:  .BYTE   061,040,174                  ;PACKED DECIMAL STRING 6
 6243
 6244
 6245
 6246                                          .EVEN
 6247
 6248  022274                         TCVPLI:                        ;INLINE TEST CASE
 6249  022274  060012                          .WORD   60012                       ;SRC. DATA TYPE = SIGNED PACKED, LENGTH - 12
 6250  022276  022304                          .WORD   PLI                         ;POINTER TO SRC. STRING
 6251  022300  000000                          .WORD   0                           ;LONG INTEGER RESULT, LOW
 6252  022302  000000                          .WORD   0                           ;LONG INTEGER RESULT, HI, AND SIGN
 6253
 6254  022304     001     021     021 PLI:     .BYTE   1,21,21,21,21,21,34        ;INLINE PACKED DECIMAL SRC. STRING
 6255  022307     021     021     021
 6256  022312     034
 6257                                                                             ;  - +1111111111 IN BCD
 6258
 6259          022314                          .EVEN
```

```
                                .SBTTL  CVTNL
                                ;*****************************************************************
                                ;
                                ;  CVTNL TEST
                                ;
                                ;*****************************************************************
                                INLINE <XCVTNL:>
                                                                                XCVTNL:
                                INLINE <SCOPE>
                                                                                SCOPE
022314 000004                   LET $TIMES := #20               ;ITERATION COUNT
                                                                                MOV     #20,$TIMES
022316 012737 000020 000404     LET COUNT := TCVTNL             ;GET TEST COUNT
                                                                                MOV     TCVTNL,COUNT
022324 013737 023576 000466     LET TSTCAS :- #TCVTNL+2         ;POINT TO FIRST TEST CASE
                                                                                MOV     #TCVTNL+2,TSTCAS
022332 012737 023600 000542     ;REPEAT
                                INLINE <$5053:>
022340                                                                          $5053:
022340
                                   ;+
                                   ; GET TEST DATA FROM TABLE
                                   ;-
                                   LET R0 := TSTCAS
022340                                                                          MOV     TSTCAS,R0
022340 013700 000542               LET DATA00 := (R0)+          ;SRC. DATA TYPE AND LENGTH
022344                                                                          MOV     (R0)+,DATA00
022344 012037 000560               LET DATA01 := (R0)           ;SRC. POINTER
022350                                                                          MOV     (R0),DATA01
022350 011037 000562
                                   ;+
                                   ; SET UP R0.EXP, R1.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                   ;-
022354                             LET R0.EXP := #0
022354 005037 000522                                                            CLR     R0.EXP
                                   LET R1.EXP := #0
022360                                                                          CLR     R1.EXP
022360 005037 000524               IF #1 SETIN COUNT THEN
022364                                                                          BIT     #1,COUNT
022364 032737 000001 000466                                                     BEQ     $50720
022372 001405
022374                                LET R4 :- #177777
022374 012704 177777                                                            MOV     #177777,R4
022400                                LET R5 := #177777
022400 012705 177777                                                            MOV     #177777,R5
022404                             ELSE
022404 000402                                                                   BR      $50721
022406                                                                  $50720:
022406                                LET R4 := #0
022406 005004                                                                   CLR     R4
022410                                LET R5 :- #0
022410 005005                                                                   CLR     R5
022412                             ENDIF
022412                                                                  $50721:
022412                             LET R4.EXP :  R4
```

```
  6316  022412  010437  000532                                                        MOV     R4,R4.EXP
  6317  022416                        LET R5.EXP := R5
  6318  022416  010537  000534                                                        MOV     R5,R5.EXP
  6319
  6320                                ;+
  6321                                ; CONVERT NUMERIC DECIMAL STRING AND LOAD INTO R2.EXP AND R3.EXP
  6322                                ;-
  6323
  6324  022422                        LET CC.EXP := #0
  6325  022422  005037  000520                                                        CLR     CC.EXP
  6326  022426                        LET R0 := #DSBUF1                 ;DST. POINTER
  6327  022426  012700  062370                                                        MOV     #DSBUF1,R0
  6328  022432                        LET R1 := DATA01                  ;SRC. POINTER
  6329  022432  013701  000562                                                        MOV     DATA01,R1
  6330  022436                        LET SIGN0 := #0
  6331  022436  005037  000446                                                        CLR     SIGN0
  6332  022442                        LET DSLEN1 := DATA00 CLR.BY #177740          ;GET SRC.LEN
  6333  022442  013737  000560  000512                                               MOV     DATA00,DSLEN1
  6334  022450  042737  177740  000512                                               BIC     #177740,DSLEN1
  6335  022456                        IF DSLEN1 EQ #0 THEN              ;SRC.LEN = 0
  6336  022456  005737  000512                                                        TST     DSLEN1
  6337  022462  001010                                                               BNE     $50722
  6338  022464                            LET CC.EXP := CC.EXP SET.BY #ZBIT
  6339  022464  052737  000004  000520                                               BIS     #ZBIT,CC.EXP
  6340  022472                            LET R2.EXP := #0
  6341  022472  005037  000526                                                        CLR     R2.EXP
  6342  022476                            LET R3.EXP := #0
  6343  022476  005037  000530                                                        CLR     R3.EXP
  6344  022502                        ELSE                              ;SRC.LEN > 0
  6345  022502  000417                                                               BR      $50723
  6346  022504                                                                $50722:
  6347  022504                            LET R0 := #DSBUF1 + #10. - DSLEN1
  6348  022504  012700  062370                                                        MOV     #DSBUF1,R0
  6349  022510  062700  000012                                                        ADD     #10.,R0
  6350  022514  163700  000512                                                        SUB     DSLEN1,R0
  6351  022520
  6352  022520  013737  000512  000474       LET TEMP0 := DSLEN1                    MOV     DSLEN1,TEMP0
  6353  022526                            REPEAT
  6354  022526                                                                $50724:
  6355  022526
  6356  022526  112120                       LET (R0)+ :B= (R1)+           ;XFER TO INTERMEDIATE
                                                                                      MOVB    (R1)+,(R0)+
  6357  022530
  6358  022530  005337  000474                   LET TEMP0 := TEMP0 - #1             DEC     TEMP0
  6359  022534                            UNTIL TEMP0 EQ #0
  6360  022534  005737  000474                                                        TST     TEMP0
  6361  022540  001372                                                               BNE     $50724
  6362  022542                        ENDIF
  6363  022542                                                                $50723
  6364  022542
  6365  022542  013737  000560  000462   LET DATTYP := DATA00 CLR.BY #107777          MOV     DATA00,DATTYP
  6366  022550  042737  107777  000462                                               BIC     #107777,DATTYP
  6367
                                    ;GET THE SIGN OUT OF THE INTERMEDIATE RESULTS
  6368  022556                    IF DSLEN1 NE #0 THEN                  ;SRC.LEN > 0
  6369  022556  005737  000512                                                        TST     DSLEN1
  6370  022562  001533                                                               BEQ     $50725
  6371  022564                        IF DATTYP EQ #0 OR DATTYP EQ #10000 THEN      ;*** ZONED ***
```

```
6372  022564  005737  000462                                                          TST     DATTYP
6373  022570  001404                                                                  BEQ     $50726
6374  022572  023727  000462  010000                                                  CMP     DATTYP,#10000
6375  022600  001020                                                                  BNE     $50727
6376  022602                                                                  $50726:
6377  022602                          LET R0 := R0 - #1                       ;POINT TO LAST BYTE
6378  022602  005300                                                                  DEC     R0
6379  022604                          LET TEMP0 :B= (R0) CLR.BY #17
6380  022604  111037  000474                                                          MOVB    (R0),TEMP0
6381  022610  142737  000017  000474                                                  BICB    #17,TEMP0
6382  022616                          IFB TEMP0 EQ #160 THEN                    ;NEGATIVE
6383  022616  123727  000474  000160                                                  CMPB    TEMP0,#160
6384  022624  001006                                                                  BNE     $50730
6385  022626                             LET SIGN0 := #-1
6386  022626  012737  177777  000446                                                  MOV     #-1,SIGN0
6387  022634                             LET CC.EXP := CC.EXP SET.BY #NBIT
6388  022634  052737  000010  000520                                                  BIS     #NBIT,CC.EXP
6389  022642                          ENDIF
6390  022642                       ENDIF                                      $50730:
6391  022642
6392  022642                                                                  $50727:
6393  022642                       IF DATTYP EQ #20000 OR DATTYP EQ #30000 THEN ;*** OVERPUNCH ***
6394  022642  023727  000462  020000                                                  CMP     DATTYP,#20000
6395  022650  001404                                                                  BEQ     $50731
6396  022652  023727  000462  030000                                                  CMP     DATTYP,#30000
6397  022660  001044                                                                  BNE     $50732
6398  022662                                                                  $50731:
6399  022662                          IF DATTYP EQ #20000 THEN                ;TRAILING
6400  022662  023727  000462  020000                                                  CMP     DATTYP,#20000
6401  022670  001002                                                                  BNE     $50733
6402  022672                             LET R0 := R0 - #1
6403  022672  005300                                                                  DEC     R0
6404  022674                          ELSE                                       ;LEADING
6405  022674  000406                                                                  BR      $50734
6406  022676                                                                  $50733:
6407  022676                             LET R0 := #DSBUF1 + #10. - DSLEN1
6408  022676  012700  062370                                                          MOV     #DSBUF1,R0
6409  022702  062700  000012                                                          ADD     #10.,R0
6410  022706  163700  000512                                                          SUB     DSLEN1,R0
6411  022712                          ENDIF
6412  022712                                                                  $50734:
6413  022712                          LET TEMP0 :B= (R0)                      ;GET SIGN/DIGIT
6414  022712  111037  000474                                                          MOVB    (R0),TEMP0
6415  022716                          LET R1 := #SGNDGT                       ;TABLE ADDRESS
6416  022716  012701  023470                                                          MOV     #SGNDGT,R1
6417  022722                          REPEAT
6418  022722                                                                  $50735:
6419  022722                             LET TEMP1 :B= (R1)+
6420  022722  112137  000476                                                          MOVB    (R1)+,TEMP1
6421  022726                             LET R1 := R1 + #1                    ;SKIP OVER ONE ENTRY
6422  022726  005201                                                                  INC     R1
6423  022730                          UNTIL TEMP0 EQ TEMP1
6424  022730  023737  000474  000476                                                  CMP     TEMP0,TEMP1
6425  022736  001371                                                                  BNE     $50735
6426  022740                          LET R1 := R1 - #1                       ;BACK UP TO CORRECT ENTRY
6427  022740  005301                                                                  DEC     R1
```

```
6428  022742
6429  022742  132711  000200          IFB #BIT07 SETIN (R1) THEN          ;NEGATIVE
6430  022746  001406                                                              BITB    #BIT07,(R1)
6431  022750                                                                      BEQ     $50736
6432  022750  052737  000010  000520      LET CC.EXP := CC.EXP SET.BY #NBIT
6433  022756                                                                      BIS     #NBIT,CC.EXP
6434  022756  012737  177777  000446      LET SIGNO := #-1
6435  022764                                                                      MOV     #-1,SIGNO
6436  022764          ENDIF                                                 $50736:
6437  022764
6438  022764  111110      LET (R0) :B= (R1) CLR.BY #BIT07                 ;PUT CORRECT DIGIT INTO INTERMEDIATE RES
6439  022766  142710  000200                                                       MOVB    (R1),(R0)
6440  022772                                                                      BICB    #BIT07,(R0)
6441  022772  ENDIF
6442  022772                                                                $50732:
6443  022772  023727  000462  050000  IF DATTYP EQ #50000 THEN              ;LEADING SEPARATE
6444  023000  001003                                                              CMP     DATTYP,#50000
6445  023002                                                                      BNE     $50737
6446  023002  013701  000562       LET R1 := DATA01 - #1                   ;POINT TO SIGN
6447  023006  005301                                                              MOV     DATA01,R1
6448  023010                                                                      DEC     R1
6449  023010  ENDIF
6450  023010                                                                $50737:
6451  023010  023727  000462  050000  IF DATTYP EQ #50000 OR DATTYP EQ #40000 THEN
6452  023016  001404                                                              CMP     DATTYP,#50000
6453  023020  023727  000462  040000                                             BEQ     $50740
6454  023026  001011                                                              CMP     DATTYP,#40000
6455  023030                                                                      BNE     $50741
6456  023030                                                                $50740:
6457  023030  121127  000055          IFB (R1) EQ #55 THEN                ;NEGATIVE
6458  023034  001006                                                              CMPB    (R1),#55
6459  023036                                                                      BNE     $50742
6460  023036  012737  177777  000446      LET SIGNO := #-1
6461  023044                                                                      MOV     #-1,SIGNO
6462  023044  052737  000010  000520      LET CC.EXP := CC.EXP SET.BY #NBIT
6463  023052                                                                      BIS     #NBIT,CC.EXP
6464  023052          ENDIF                                                 $50742:
6465  023052
6466  023052  ENDIF                                                       $50741:
6467  023052
6468  023052  ;CLEAR OUT UPPER NIBBLE OF INTERMEDIATE RESULTS             $50725:
6469          INCR R0 FROM #DSBUF1 TO #DSBUF1+37 BY #1
6470  023052
6471  023052  012700  062370                                                     MOV     #DSBUF1,R0
6472  023056  000401                                                              BR      $50743
6473  023060                                                                $50744:
6474  023060  005200                                                              INC     R0
6475  023062                                                                $50743:
6476  023062  020027  062427                                                     CMP     R0,#DSBUF1+37
6477  023066  003003                                                              BGT     $50745
6478  023070
6479  023070  142710  000360          LET (R0) :B= (R0) CLR.BY #360               BICB    #360,(R0)
6480  023074
6481  023074  000771      ENDINC                                                  BR      $50744
6482  023076                                                                $50745:
6483          ;LOAD UP R2.EXP AND R3.EXP WITH FINAL RESULT
```

```
6484  023076                        CALL CVTIL                                  JSR     PC,CVTIL
6485  023076  004737  031266
6486  023102                        IF SIGN0 EQ #-1 THEN                        CMP     SIGN0,#-1
6487  023102  023727  000446  177777                                            BNE     $50746
6488  023110  001014
6489  023112                              LET CC.EXP := CC.EXP SET.BY #NBIT     BIS     #NBIT,CC.EXP
6490  023112  052737  000010  000520
6491  023120                              IF R2.EXP NE #0 OR R3.EXP NE #0 THEN  TST     R2.EXP
6492  023120  005737  000526                                                    BNE     $50747
6493  023124  001003                                                           TST     R3.EXP
6494  023126  005737  000530                                                    BEQ     $50750
6495  023132  001403
6496  023134                                                              $50747:
6497  023134                                LET CC.EXP := CC.EXP SET.BY #CBIT
6498  023134  052737  000001  00052C                                          BIS     #CBIT,CC.EXP
6499  023142                              ENDIF
6500  023142                                                              $50750:
6501  023142                        ENDIF
6502  023142                                                              $50746:
6503
6504                                ;+
6505                                ; SET UP R0 THRU R3
6506                                ;-
6507
6508  023142                        LET R0 := DATA00            ;SRC.DSCR
6509  023142  013700  000560                                                   MOV     DATA00,R0
6510  023146                        LET R1 := DATA01            ;SRC.DSCR
6511  023146  013701  000562                                                   MOV     DATA01,R1
6512  023152                        LET R2 := #0
6513  023152  005002                                                           CLR     R2
6514  023154                        LET R3 := #0
6515  023154  005003                                                           CLR     R3
6516
6517                                ;+
6518                                ; DO THE CIS INSTRUCTION
6519                                ;-
6520
6521  023156                        INLINE <CVTNL>
6522  023156  076053                                                           CVTNL
6523
6524
6525                                ;+
6526                                ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
6527                                ;-
6528
6529  023160                        LET CC := PSW
6530  023160  013737  177776  000516                                           MOV     PSW,CC
6531  023166                        LET CC := CC CLR.BY #177760
6532  023166  042737  177760  000516                                          BIC     #177760,CC
6533  023174                        IF CC NE CC.EXP THEN
6534  023174  023737  000516  000520                                          CMP     CC,CC.EXP
6535  023202  001402                                                           BEQ     $50751
6536  023204                          CALL ERROR
6537  023204  004737  056274                                                  JSR     PC,ERROR
6538  023210                        ENDIF
6539  023210                                                              $50751:
```

```
6540  023210                          IF R0 NE R0.EXP THEN
6541  023210  020037  000522                                                CMP     R0,R0.EXP
6542  023214  001402                                                        BEQ     $50752
6543  023216                            CALL ERROR
6544  023216  004737  056274                                                JSR     PC,ERROR
6545  023222                          ENDIF
6546  023222                                                          $50752:
6547  023222                          IF R1 NE R1.EXP THEN
6548  023222  020137  000524                                                CMP     R1,R1.EXP
6549  023226  001402                                                        BEQ     $50753
6550  023230                            CALL ERROR
6551  023230  004737  056274                                                JSR     PC,ERROR
6552  023234                          ENDIF
6553  023234                                                          $50753:
6554  023234                          IF R2 NE R2.EXP THEN
6555  023234  020237  000526                                                CMP     R2,R2.EXP
6556  023240  001402                                                        BEQ     $50754
6557  023242                            CALL FRROR
6558  023242  004737  056274                                                JSR     PC,ERROR
6559  023246                          ENDIF
6560  023246                                                          $50754:
6561  023246                          IF R3 NE R3.EXP THEN
6562  023246  020337  000530                                                CMP     R3,R3.EXP
6563  023252  001402                                                        BEQ     $50755
6564  023254                            CALL ERROR
6565  023254  004737  056274                                                JSR     PC,ERROR
6566  023260                          ENDIF
6567  023260                                                          $50755:
6568  023260                          IF R4 NE R4.EXP THEN
6569  023260  020437  000532                                                CMP     R4,R4.EXP
6570  023264  001402                                                        BEQ     $50756
6571  023266                            CALL ERROR
6572  023266  004737  056274                                                JSR     PC,ERROR
6573  023272                          ENDIF
6574  023272                                                          $50756:
6575  023272                          IF R5 NE R5.EXP THEN
6576  023272  020537  000534                                                CMP     R5,R5.EXP
6577  023276  001402                                                        BEQ     $50757
6578  023300                            CALL ERROR
6579  023300  004737  056274                                                JSR     PC,ERROR
6580  023304                          ENDIF
6581  023304                                                          $50757:
6582
6583  023304                             LET TSTCAS := TSTCAS + #4
6584  023304  062737  000004  000542                                        ADD     #4,TSTCAS
6585  023312                             LET COUNT := COUNT - #1
6586  023312  005337  000466                                                DEC     COUNT
6587                                  ;UNTIL COUNT EQ #0
6588  023316                          IF COUNT NE #0 THEN
6589  023316  005737  000466                                                TST     COUNT
6590  023322  001402                                                        BEQ     $50760
6591  023324                             INLINE <JMP $5053>
6592  023324  000137  022340                                                JMP $5053
6593  023330                          ENDIF
6594  023330                                                          $50760:
6595                                  ;*
```

CVTNL SEQ 0146

```
6596                                    ; DO ONE INLINE CASE - CVTNLI
6597                                    ;-
6598
6599  023330                            CALL    CLRREG
6600  023330  004737  055330                                    JSR     PC,CLRREG
6601  023334                            CALL    CLRDSB
6602  023334  004737  055520                                    JSR     PC,CLRDSB
6603  023340                            INLINE    <CVTNLI>
6604  023340  076153                                            CVTNLI
6605  023342                            INLINE    <.WORD    TCVNLI>
6606  023342  024324                                            .WORD   TCVNLI
6607  023344                            INLINE    <.WORD    TCVNLI+4>
6608  023344  024330                                            .WORD   TCVNLI+4
6609  023346                            LET CC := PSW
6610  023346  013737  177776  000516                            MOV     PSW,CC
6611  023354                            LET CC := CC CLR.BY #177760
6612  023354  042737  177760  000516                            BIC     #177760,CC
6613  023362                            IF CC NE #0 THEN
6614  023362  005737  000516                                    TST     CC
6615  023366  001402                                            BEQ     $50761
6616  023370                              CALL ERROR
6617  023370  004737  056274                                    JSR     PC,ERROR
6618  023374                            ENDIF
6619  023374                                                  $50761:
6620  023374                            IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
6621  023374  005700                                            TST     R0
6622  023376  001004                                            BNE     $50762
6623  023400  005701                                            TST     R1
6624  023402  001002                                            BNE     $50762
6625  023404  005702                                            TST     R2
6626  023406  001402                                            BEQ     $50763
6627  023410                                                  $50762:
6628  023410                              CALL ERROR
6629  023410  004737  056274                                    JSR     PC,ERROR
6630  023414                            ENDIF
6631  023414                                                  $50763:
6632  023414                            IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
6633  023414  005703                                            TST     R3
6634  023416  001004                                            BNE     $50764
6635  023420  005704                                            TST     R4
6636  023422  001002                                            BNE     $50764
6637  023424  005705                                            TST     R5
6638  023426  001402                                            BEQ     $50765
6639  023430                                                  $50764:
6640  023430                              CALL ERROR
6641  023430  004737  056274                                    JSR     PC,ERROR
6642  023434                            ENDIF
6643  023434                                                  $50765:
6644  023434                            IF TCVNLI+4 NE #32707 THEN
6645  023434  023727  024330  032707                            CMP     TCVNLI+4,#32707
6646  023442  001402                                            BEQ     $50766
6647  023444                              CALL ERROR
6648  023444  004737  056274                                    JSR     PC,ERROR
6649  023450                            ENDIF
6650  023450                                                  $50766:
6651  023450                            IF TCVPLI+6 NE #41072 THEN
```

```
                                                                                        CMP     TCVPLI+6,#41072
                                                                                        BEQ     $50767
                          CALL ERROR
                                                                                        JSR     PC,ERROR
                        ENDIF
                                                                                $50767:
                        INLINE   <JMP   XCVTPN>
                                                                                        JMP     XCVTPN


                        ;+
                        ; TABLE FOR INTERPRETING ACCEPTABLE SIGN/DIGIT COMBINATIONS FOR OVERPUNCH
                        ;-

023470  173  000  060  SGNDGT: .BYTE   173,0,60,0,133,0,77,0          ;+0
023473  000  133  000
023476  077  000
023500  101  001  061          .BYTE   101,1,61,1                     ;+1
023503  001
023504  102  002  062          .BYTE   102,2,62,2                     ;+2
023507  002
023510  103  003  063          .BYTE   103,3,63,3                     ;+3
023513  003
023514  104  004  064          .BYTE   104,4,64,4                     ;+4
023517  004
023520  105  005  065          .BYTE   105,5,65,5                     ;+5
023523  005
023524  106  006  066          .BYTE   106,6,66,6                     ;+6
023527  006
023530  107  007  067          .BYTE   107,7,67,7                     ;+7
023533  007
023534  110  010  070          .BYTE   110,10,70,10                   ;+8
023537  010
023540  111  011  071          .BYTE   111,11,71,11                   ;+9
023543  011
023544  175  200  135          .BYTE   175,200,135,200,41,200,72,200  ;-0
023547  200  041  200
023552  072  200
023554  112  201               .BYTE   112,201                        ;-1
023556  113  202               .BYTE   113,202                        ;-2
023560  114  203               .BYTE   114,203                        ;-3
023562  115  204               .BYTE   115,204                        ;-4
023564  116  205               .BYTE   116,205                        ;-5
023566  117  206               .BYTE   117,206                        ;-6
023570  120  207               .BYTE   120,207                        ;-7
023572  121  210               .BYTE   121,210                        ;-8
023574  122  211               .BYTE   122,211                        ;-9


                        ;+
                        ; TABLE OF TEST CASES FOR CVTNL
```

```
                                       :-
                                       
023576  000055                 TCVTNL: .WORD   45.             ;# OF TEST CASES FOR CVTNL
                                       
023600  000000                         .WORD   0                       ;SRC. DATA TYPE AND LENGTH
023602  024065                         .WORD   CVTNL1                  ;POINTER TO SRC. STRING
                                       
023604  050000                         .WORD   50000           ;TEST CASE NUMBER 2
023606  024067                         .WORD   CVTNL2
                                       
023610  040004                         .WORD   40004           ;TEST CASE NUMBER 3
023612  024071                         .WORD   CVTNL3
                                       
023614  050004                         .WORD   50004           ;TEST CASE NUMBER 4
023616  024077                         .WORD   CVTNL4
                                       
023620  030007                         .WORD   30007           ;TEST CASE NUMBER 5
023622  024104                         .WORD   CVTNL5
                                       
023624  000002                         .WORD   2               ;TEST CASE NUMBER 6
023626  024114                         .WORD   CVTNL6
                                       
023630  020005                         .WORD   20005           ;TEST CASE NUMBER 7
023632  024117                         .WORD   CVTNL7
                                       
023634  010005                         .WORD   10005           ;TEST CASE NUMBER 8
023636  024125                         .WORD   CVTNL8
                                       
023640  040004                         .WORD   40004           ;TEST CASE NUMBER 9
023642  024133                         .WORD   CVTNL9
                                       
023644  000012                         .WORD   12              ;TEST CASE NUMBER 10
023646  024141                         .WORD   CVTNLA
                                       
023650  020002                         .WORD   20002           ;TEST CASE NUMBER 11
023652  024154                         .WORD   CVTNLB
                                       
023654  020002                         .WORD   20002           ;TEST CASE NUMBER 12
023656  024157                         .WORD   CVTNLC
                                       
023660  020002                         .WORD   20002           ;TEST CASE NUMBER 13
023662  024162                         .WORD   CVTNLD
                                       
023664  020002                         .WORD   20002           ;TEST CASE NUMBER 14
023666  024165                         .WORD   CVTNLE
                                       
023670  020002                         .WORD   20002           ;TEST CASE NUMBER 15
023672  024170                         .WORD   CVTNLF
                                       
023674  020002                         .WORD   20002           ;TEST CASE NUMBER 16
023676  024173                         .WORD   CVTNLG
                                       
023700  020002                         .WORD   20002           ;TEST CASE NUMBER 17
023702  024176                         .WORD   CVTNLH
                                       
023704  020002                         .WORD   20002           ;TEST CASE NUMBER 18
```

```
 6764  023706  024201                          .WORD   CVTNL$
 6765
 6766  023710  020002                          .WORD   20002           ;TEST CASE NUMBER 19
 6767  023712  024204                          .WORD   CVTNLJ
 6768
 6769  023714  020002                          .WORD   20002           ;TEST CASE NUMBER 20
 6770  023716  024207                          .WORD   CVTNLK
 6771
 6772  023720  020002                          .WORD   20002           ;TEST CASE NUMBER 21
 6773  023722  024212                          .WORD   CVTNLL
 6774
 6775  023724  020002                          .WORD   20002           ;TEST CASE NUMBER 22
 6776  023726  024215                          .WORD   CVTNLM
 6777
 6778  023730  020002                          .WORD   20002           ;TEST CASE NUMBER 23
 6779  023732  024220                          .WORD   CVTNLN
 6780
 6781  023734  020002                          .WORD   20002           ;TEST CASE NUMBER 24
 6782  023736  024223                          .WORD   CVTNLO
 6783
 6784  023740  020002                          .WORD   20002           ;TEST CASE NUMBER 25
 6785  023742  024226                          .WORD   CVTNLP
 6786
 6787  023744  020002                          .WORD   20002           ;TEST CASE NUMBER 26
 6788  023746  024231                          .WORD   CVTNLQ
 6789
 6790  023750  020002                          .WORD   20002           ;TEST CASE NUMBER 27
 6791  023752  024234                          .WORD   CVTNLR
 6792
 6793  023754  020002                          .WORD   20002           ;TEST CASE NUMBER 28
 6794  023756  024237                          .WORD   CVTNLS
 6795
 6796  023760  020002                          .WORD   20002           ;TEST CASE NUMBER 29
 6797  023762  024242                          .WORD   CVTNLT
 6798
 6799  023764  020002                          .WORD   20002           ;TEST CASE NUMBER 30
 6800  023766  024245                          .WORD   CVTNLU
 6801
 6802  023770  020002                          .WORD   20002           ;TEST CASE NUMBER 31
 6803  023772  024250                          .WORD   CVTNLV
 6804
 6805  023774  020002                          .WORD   20002           ;TEST CASE NUMBER 32
 6806  023776  024253                          .WORD   CVTNLW
 6807
 6808  024000  020002                          .WORD   20002           ;TEST CASE NUMBER 33
 6809  024002  024256                          .WORD   CVTNLX
 6810
 6811  024004  020002                          .WORD   20002           ;TEST CASE NUMBER 34
 6812  024006  024261                          .WORD   CVTNLY
 6813
 6814  024010  020002                          .WORD   20002           ;TEST CASE NUMBER 35
 6815  024012  024264                          .WORD   CVTNLZ
 6816
 6817  024014  020002                          .WORD   20002           ;TEST CASE NUMBER 36
 6818  024016  024267                          .WORD   CVTNAA
 6819
```

```
6820  024020  020002                          .WORD   20002           ;TEST CASE NUMBER 37
6821  024022  024272                          .WORD   CVTNBB
6822
6823  024024  020002                          .WORD   20002           ;TEST CASE NUMBER 38
6824  024026  024275                          .WORD   CVTNCC
6825
6826  024030  020002                          .WORD   20002           ;TEST CASE NUMBER 39
6827  024032  024300                          .WORD   CVTNDD
6828
6829  024034  020002                          .WORD   20002           ;TEST CASE NUMBER 40
6830  024036  024303                          .WORD   CVTNEE
6831
6832  024040  020002                          .WORD   20002           ;TEST CASE NUMBER 41
6833  024042  024306                          .WORD   CVTNFF
6834
6835  024044  020002                          .WORD   20002           ;TEST CASE NUMBER 42
6836  024046  024311                          .WORD   CVTNGG
6837
6838  024050  020002                          .WORD   20002           ;TEST CASE NUMBER 43
6839  024052  024314                          .WORD   CVTNHH
6840
6841  024054  020002                          .WORD   20002           ;TEST CASE NUMBER 44
6842  024056  024317                          .WORD   CVTNII
6843
6844  024060  020002                          .WORD   20002           ;TEST CASE NUMBER 45
6845  024062  024322                          .WORD   CVTNJJ
6846
6847  024064      000                         .BYTE                           ;FOR LEADING SEPARATE SIGN
6848  024065      000             CVTNL1:     .BYTE                           ;DECIMAL NUMERIC SRC STRING 1
6849
6850  024066      055                         .BYTE   055
6851  024067      000             CVTNL2:     .BYTE                           ;DECIMAL NUMERIC SRC STRING 2
6852
6853  024070      000                         .BYTE
6854  024071      061     060     061 CVTNL3: .BYTE   061,060,061,060,053     ;DECIMAL NUMERIC SRC STRING 3
6855  024074      060     053
6856
6857  024076      053                         .BYTE   053
6858  024077      061     060     061 CVTNL4: .BYTE   061,060,061,065         ;DECIMAL NUMERIC SRC STRING 4
6859  024102      065
6860
6861  024103      000                         .BYTE
6862  024104      112     020     000 CVTNL5: .BYTE   112,020,000,000,000,007,002 ;DECIMAL NUMERIC SRC STRING 5
6863  024107      000     000     007
6864  024112      002
6865
6866  024113      000                         .BYTE
6867  024114      001     171         CVTNL6: .BYTE   001,171                 ;DECIMAL NUMERIC SRC STRING 6
6868
6869  024116      000                         .BYTE
6870  024117      003     001     002 CVTNL7: .BYTE   003,001,002,000,107     ;DECIMAL NUMERIC SRC STRING 7
6871  024122      000     107
6872
6873  024124      000                         .BYTE
6874  024125      001     000     002 CVTNL8: .BYTE   001,000,002,000,067     ;DECIMAL NUMERIC SRC STRING 8
6875  024130      000     067
```

```
 6876
 6877  024132  000                                    .BYTE
 6878  024133  061  060  061  CVTNL9: .BYTE   061,060,061,060,053              ;DECIMAL NUMERIC SRC STRING 9
 6879  024136  060  053
 6880
 6881  024140  000                                    .BYTE
 6882  024141  002  001  004  CVTNLA: .BYTE   002,001,004,007,004,010,003,006,004,067   ;DECIMAL NUMERIC SRC STR A
 6883  024144  007  004  010
 6884  024147  003  006  004
 6885  024152  067
 6886
 6887  024153  000                                    .BYTE
 6888  024154  061  173       CVTNLB: .BYTE   61,173          ;DECIMAL NUMERIC SRC STRING 11
 6889
 6890  024156  000                                    .BYTE
 6891  024157  061  060       CVTNLC: .BYTE   61,60           ;DECIMAL NUMERIC SRC STRING 12
 6892
 6893  024161  000                                    .BYTE
 6894  024162  061  133       CVTNLD: .BYTE   61,133          ;DECIMAL NUMERIC SRC STRING 13
 6895
 6896  024164  000                                    .BYTE
 6897  024165  061  077       CVTNLE: .BYTE   61,77           ;DECIMAL NUMERIC SRC STRING 14
 6898
 6899  024167  000                                    .BYTE
 6900  024170  061  101       CVTNLF: .BYTE   61,101          ;DECIMAL NUMERIC SRC STRING 15
 6901
 6902  024172  000                                    .BYTE
 6903  024173  061  061       CVTNLG: .BYTE   61,61           ;DECIMAL NUMERIC SRC STRING 16
 6904
 6905  024175  000                                    .BYTE
 6906  024176  061  102       CVTNLH: .BYTE   61,102          ;DECIMAL NUMERIC SRC STRING 17
 6907
 6908  024200  000                                    .BYTE
 6909  024201  061  062       CVTNL$: .BYTE   61,62           ;DECIMAL NUMERIC SRC STRING 18
 6910
 6911  024203  000                                    .BYTE
 6912  024204  061  103       CVTNLJ: .BYTE   61,103          ;DECIMAL NUMERIC SRC STRING 19
 6913
 6914  024206  000                                    .BYTE
 6915  024207  061  063       CVTNLK: .BYTE   61,63           ;DECIMAL NUMERIC SRC STRING 20
 6916
 6917  024211  000                                    .BYTE
 6918  024212  061  104       CVTNLL: .BYTE   61,104          ;DECIMAL NUMERIC SRC STRING 21
 6919
 6920  024214  000                                    .BYTE
 6921  024215  061  064       CVTNLM: .BYTE   61,64           ;DECIMAL NUMERIC SRC STRING 22
 6922
 6923  024217  000                                    .BYTE
 6924  024220  061  105       CVTNLN: .BYTE   61,105          ;DECIMAL NUMERIC SRC STRING 23
 6925
 6926  024222  000                                    .BYTE
 6927  024223  061  065       CVTNLO: .BYTE   61,65           ;DECIMAL NUMERIC SRC STRING 24
 6928
 6929  024225  000                                    .BYTE
 6930  024226  061  106       CVTNLP: .BYTE   61,106          ;DECIMAL NUMERIC SRC STRING 25
 6931
```

```
6932  024230  000                              .BYTE
6933  024231  061  066        CVTNLQ:  .BYTE   61,66          ;DECIMAL NUMERIC SRC STRING 26
6934
6935  024233  000                              .BYTE
6936  024234  061  107        CVTNLR:  .BYTE   61,107         ;DECIMAL NUMERIC SRC STRING 27
6937
6938  024236  000                              .BYTE
6939  024237  061  067        CVTNLS:  .BYTE   61,67          ;DECIMAL NUMERIC SRC STRING 28
6940
6941  024241  000                              .BYTE
6942  024242  061  110        CVTNLT:  .BYTE   61,110         ;DECIMAL NUMERIC SRC STRING 29
6943
6944  024244  000                              .BYTE
6945  024245  061  070        CVTNLU:  .BYTE   61,70          ;DECIMAL NUMERIC SRC STRING 30
6946
6947  024247  000                              .BYTE
6948  024250  061  111        CVTNLV:  .BYTE   61,111         ;DECIMAL NUMERIC SRC STRING 31
6949
6950  024252  000                              .BYTE
6951  024253  061  071        CVTNLW.  .BYTE   61,71          ;DECIMAL NUMERIC SRC STRING 32
6952
6953  024255  000                              .BYTE
6954  024256  061  175        CVTNLX:  .BYTE   61,175         ;DECIMAL NUMERIC SRC STRING 33
6955
6956  024260  000                              .BYTE
6957  024261  061  135        CVTNLY:  .BYTE   61,135         ;DECIMAL NUMERIC SRC STRING 34
6958
6959  024263  000                              .BYTE
6960  024264  061  041        CVTNLZ:  .BYTE   61,41          ;DECIMAL NUMERIC SRC STRING 35
6961
6962  024266  000                              .BYTE
6963  024267  061  072        CVTNAA:  .BYTE   61,72          ;DECIMAL NUMERIC SRC STRING 36
6964
6965  024271  000                              .BYTE
6966  024272  061  112        CVTNBB:  .BYTE   61,112         ;DECIMAL NUMERIC SRC STRING 37
6967
6968  024274  000                              .BYTE
6969  024275  061  113        CVTNCC:  .BYTE   61,113         ;DECIMAL NUMERIC SRC STRING 38
6970
6971  024277  000                              .BYTE
6972  024300  061  114        CVTNDD:  .BYTE   61,114         ;DECIMAL NUMERIC SRC STRING 39
6973
6974  024302  000                              .BYTE
6975  024303  061  115        CVTNEE:  .BYTE   61,115         ;DECIMAL NUMERIC SRC STRING 40
6976
6977  024305  000                              .BYTE
6978  024306  061  116        CVTNFF:  .BYTE   61,116         ;DECIMAL NUMERIC SRC STRING 41
6979
6980  024310  000                              .BYTE
6981  024311  061  117        CVTNGG:  .BYTE   61,117         ;DECIMAL NUMERIC SRC STRING 42
6982
6983  024313  000                              .BYTE
6984  024314  061  120        CVTNHH:  .BYTE   61,120         ;DECIMAL NUMERIC SRC STRING 43
6985
6986  024316  000                              .BYTE
6987  024317  061  121        CVTNII:  .BYTE   61,121         ;DECIMAL NUMERIC SRC STRING 44
```

```
 6988
 6989  024321      000                          .BYTE
 6990  024322      061      122         CVTNJJ: .BYTE   61,122          ;DECIMAL NUMERIC SRC STRING 45
 6991
 6992
 6993                                           .EVEN
 6994
 6995  024324                           TCVNLI:                 ;INLINE TEST CASE
 6996  024324  000012                           .WORD   000012          ;DATA TYPE = SIGNED ZONED, LENGTH = 12
 6997  024326  024334                           .WORD   NL1             ;ADDRESS OF DECIMAL SRC STRING
 6998  024330  000000                           .WORD   0               ;LONG INTEGER RESULT, LOW
 6999  024332  000000                           .WORD   0               ;LONG INTEGER RESULT, HI, AND SIGN
 7000
 7001  024334      061      061      061  NL1:    .BYTE   61,61,61,61,61,61,61,61,61,61           ;  = +1111111111 IN BCD
 7002  024337      061      061      061
 7003  024342      061      061      061
 7004  024345      061
 7005                                           .EVEN
 7006
```

```
                                .SBTTL  CVTPN
                                ;;*****************************************************************
                                ;
                                ;  CVTPN TEST
                                ;
                                ;;*****************************************************************
                                INLINE  <XCVTPN:>
                                                                                        XCVTPN:
                                INLINE  <SCOPE>
                                                                                        SCOPE
                                LET $TIMES := 2320              ;ITERATION COUNT
                                                                                        MOV     2320,$TIMES
                                LET COUNT := TCVTPN             ;GET TEST COUNT
                                                                                        MOV     TCVTPN,COUNT
                                LET TSTCAS := #TCVTPN+2         ;POINT TO FIRST TEST CASE
                                                                                        MOV     #TCVTPN+2,TSTCAS
                                ;REPEAT
                                INLINE  <$5054:>
                                                                                        $5054:
                                  ;+
                                  ; GET TEST DATA FROM TABLE
                                  ;-
                                  LET R0 := TSTCAS
                                                                                        MOV     TSTCAS,R0
                                  LET DATA00 := (R0)+           ;SRC DATA TYPE AND LENGTH
                                                                                        MOV     (R0)+,DATA00
                                  LET DATA01 := (R0)+           ;POINTER TO PACKED SRC STRING
                                                                                        MOV     (R0)+,DATA01
                                  LET DATA02 := (R0)            ;DST.LEN
                                                                                        MOV     (R0),DATA02
                                  ;+
                                  ; SET UP R0.EXP, R1.EXP, R3.EXP, R4.EXP, R5.EXP, R4, AND R5.
                                  ;-
                                  LET R0.EXP := #0
                                                                                        CLR     R0.EXP
                                  LET R1.EXP := #0
                                                                                        CLR     R1.EXP
                                  LET R3.EXP := #DS.DST
                                                                                        MOV     #DS.DST,R3.EXP
                                  IF #1 SETIN COUNT THEN
                                                                                        BIT     #1,COUNT
                                                                                        BEQ     $50770
                                    LET R4 := #-1
                                                                                        MOV     #-1,R4
                                    LET R5 := #-1
                                                                                        MOV     #-1,R5
                                  ELSE
                                                                                        BR      $50771
                                                                                $50770:
                                    LET R4 := #0
                                                                                        CLR     R4
                                    LET R5 := #0
```

```
7063  024454  005005                                                                  CLR     R5
7064  024456                        ENDIF
7065  024456                                                                $50771:
7066  024456                        LET R4.EXP := R4
7067  024456  010437  000532                                                MOV     R4,R4.EXP
7068  024462                        LET R5.EXP := R5
7069  024462  010537  000534                                                MOV     R5,R5.EXP
7070
7071
7072                                ;+
7073                                ; INITIALIZE THE DECIMAL STRING BUFFERS AND CC.EXP.
7074                                ;-
7075
7076  024466                        CALL CLRDSB
7077  024466  004737  055520                                                JSR     PC,CLRDSB
7078  024472                        LET CC.EXP := #0
7079  024472  005037  000520                                                CLR     CC.EXP
7080
7081
7082                                ;+
7083                                ; PUT THE SOURCE LENGTH INTO DSLEN1; PUT THE DESTINATION
7084                                ; LENGTH INTO DSLEN2.
7085                                ;-
7086
7087  024476                        LET DSLEN1 := DATA00 CLR.BY #70000
7088  024476  013737  000560  000512                                        MOV     DATA00,DSLEN1
7089  024504  042737  070000  000512                                        BIC     #70000,DSLEN1
7090  024512                        LET DSLEN2 := DATA02
7091  024512  013737  000564  000514                                        MOV     DATA02,DSLEN2
7092
7093
7094                                ;+
7095                                ; LET SIGN0 REFLECT THE SIGN OF THE SOURCE STRING.
7096                                ;-
7097
7098  024520                        LET R0 := DSLEN1
7099  024520  013700  000512                                                MOV     DSLEN1,R0
7100  024524                        INLINE   <ASR R0>
7101  024524  006200                                                        ASR     R0
7102  024526                        LET R0 := R0 + DATA01          ;POINT TO THE END OF THE STRING
7103  024526  063700  000562                                                ADD     DATA01,R0
7104  024532                        LET R1 :B= (R0) CLR.BY #360        ;GET THE SIGN NIBBLE
7105  024532  111001                                                        MOVB    (R0),R1
7106  024534  142701  000360                                                BICB    #360,R1
7107  024540                        IF DATA00 HIS #70000 OR DSLEN1 EQ #0 THEN
7108  024540  023727  000560  070000                                        CMP     DATA00,#70000
7109  024546  103003                                                        BHIS    $50772
7110  024550  005737  000512                                                TST     DSLEN1
7111  024554  001003                                                        BNE     $50773
7112  024556                                                        $50772:
7113  024556                          LET SIGN0 := #0
7114  024556  005037  000446                                                CLR     SIGN0
7115  024562                        ELSE
7116  024562  000411                                                        BR      $50774
7117  024564                                                        $50773:
7118  024564                          IF R1 EQ #14 THEN
```

```
7119  024564  020127  000014                                                    CMP     R1,#14
7120  024570  001003                                                            BNE     $50775
7121  024572
7122  024572  005037  000446                    LET SIGN0 := #0                 CLR     SIGN0
7123  024576
7124  024576  000403                          ELSE                              BR      $50776
7125  024600
7126  024600                                                          $50775:
7127  024600  012737  177777  000446            LET SIGN0 := #-1                MOV     #-1,SIGN0
7128  024606
7129  024606                                    ENDIF                 $50776:
7130  024606                                  ENDIF
7131  024606                                                          $50774:
7132
7133
7134                                          ;+
7135                                          ; CALCULATE THE NUMBER OF CHARACTERS TO BE MOVED INTO DS.EXP;
7136                                          ; USE R0.
7137                                          ;-
7138
7139  024606                                  IF DSLEN2 HIS DSLEN1 THEN       ;DST.LEN >= SRC.LEN
7140  024606  023737  000514  000512                                          CMP     DSLEN2,DSLEN1
7141  024614  103403                                                         BLO     $50777
7142  024616
7143  024616  013700  000512                    LET R0 := DSLEN1              MOV     DSLEN1,R0
7144  024622
7145  024622  000402                          ELSE                            ;SRC.LEN > DST.LEN
7146  024624                                                                  BR      $51000
7147  024624                                                          $50777:
7148  024624  013700  000514                    LET R0 := DSLEN2              MOV     DSLEN2,R0
7149  024630
7150  024630                                  ENDIF                 $51000:
7151
7152
7153                                          ;+
7154                                          ; MAKE R1 POINT TO THE END OF THE DESTINATION IN DS.EXP;
7155                                          ; MAKE R2 POINT TO THE END OF THE SOURCE STRING IN THE
7156                                          ; TABLE OF TEST CASES.
7157                                          ;-
7158
7159  024630                                  LET R1 :- #DS.EXP + DATA02 - #1
7160  024630  012701  062536                                                  MOV     #DS.EXP,R1
7161  024634  063701  000564                                                  ADD     DATA02,R1
7162  024640  005301                                                         DEC     R1
7163  024642
7164  024642  013702  000512                  LET R2 := DSLEN1               MOV     DSLEN1,R2
7165  024646
7166  024646  006202                          INLINE   <ASR R2>               ASR     R2
7167  024650
7168  024650  063702  000562                  LET R2 := R2 + DATA01          ADD     DATA01,R2
7169
7170
7171                                          ;+
7172                                          ; MOVE THE LEAST SIGNIFICANT BCD FROM THE SOURCE STRING
7173                                          ; TO THE EXPECTED DESTINATION BUFFER, IN UNPACKED FORMAT.
7174                                          ;-
```

```
7175
7176  024654                          LET R3 :B= (R2)
7177  024654  111203                                                          MOVB    (R2),R3
7178  024656                          INLINE   <ASH #-4,R3>
7179  024656  072327  177774                                                 ASH     #-4,R3
7180  024662                          LET (R1) :B= R3 SET.BY #60 CLR.BY #300
7181  024662  110311                                                         MOVB    R3,(R1)
7182  024664  152711  000060                                                BISB    #60,(R1)
7183  024670  142711  000300                                                BICB    #300,(R1)
7184  024674                          LET R0 := R0 - #1                ;DECREMENT COUNT
7185  024674  005300                                                         DEC     R0
7186
7187
7188
7189                                  ;+
7190                                  ; MOVE THE REST OF THE SOURCE TO THE EXPECIED DESTINATION
7191                                  ; BUFFER, IN UNPACKED FORMAT, USING R0 AS A COUNTER FOR
7192                                  ; THE NUMBER OF CHARACTERS TO MOVE.
7193                                  ;-
7194
7195  024676                          WHILE R0 GT #0 DO
7196  024676                                                          $51001:
7197  024676  005700                                                         TST     R0
7198  024700  003425                                                         BLE     $51002
7199  024702                            LET R1 :- R1 - #1              ;DECREMENT DEST. POINTER
7200  024702  005301                                                         DEC     R1
7201  024704                            LET R2 := R2 - #1              ;DECREMENT SRC. POINTER
7202  024704  005302                                                         DEC     R2
7203  024706                            LET (R1) :B= (R2) CLR.BY #300 SET.BY #60
7204  024706  111211                                                         MOVB    (R2),(R1)
7205  024710  142711  000300                                                BICB    #300,(R1)
7206  024714  152711  000060                                                BISB    #60,(R1)
7207  024720                            LET R0 := R0 - #1              ;DECREMENT COUNT
7208  024720  005300                                                         DEC     R0
7209  024722                            IF R0 HI #0 THEN               ;COUNT > 0
7210  024722  005700                                                         TST     R0
7211  024724  101412                                                         BLOS    $51003
7212  024726                              LET R1 := R1 - #1            ;DECREMENT DEST. POINTER
7213  024726  005301                                                         DEC     R1
7214  024730                              LET R3 :B= (R2)
7215  024730  111203                                                         MOVB    (R2),R3
7216  024732                              INLINE   <ASH     #-4,R3>
7217  024732  072327  177774                                                 ASH     #-4,R3
7218  024736                              LET (R1) :B= R3 CLR.BY #300 SET.BY #60
7219  024736  110311                                                         MOVB    R3,(R1)
7220  024740  142711  000300                                                BICB    #300,(R1)
7221  024744  152711  000060                                                BISB    #60,(R1)
7222  024750                              LET R0 := R0 - #1            ;DECREMENT COUNT
7223  024750  005300                                                         DEC     R0
7224  024752                            ENDIF
7225  024752                                                          $51003:
7226  024752                          ENDDO
7227  024752  000751                                                         BR      $51001
7228  024754                                                          $51002:
7229
7230                                  ;+
```

```
                                        ; FILL THE REST OF THE DESTINATION WITH LEADING ZEROES (60'S).
                                        ;-

024754                                  WHILE R1 GT #DS.EXP DO
024754                                                                          $51004:
024754  020127  062536                                                                  CMP     R1,#DS.EXP
024760  003403                                                                        BLE     $51005
024762                                    LET -(R1) :B= #60
024762  112741  000060                                                                MOVB    #60,-(R1)
024766                                  ENDDO
024766  000772                                                                        BR      $51004
024770                                                                          $51005:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE NBIT INTO CC.EXP
                                        ;-

024770                                  IF DSLEN2 HI #0 AND SIGN0 EQ #-1 THEN
024770  005737  000514                                                                TST     DSLEN2
024774  101407                                                                      BLOS    $51006
024776  023727  000446  177777                                                      CMP     SIGN0,#-1
025004  001003                                                                      BNE     $51006
025006                                    LET CC.EXP := CC.EXP SET.BY #NBIT
025006  052737  000010  000520                                                      BIS     #NBIT,CC.EXP
025014                                  ENDIF
025014                                                                          $51006:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE ZBIT INTO CC.EXP
                                        ;-


025014                                  IF DSLEN1 EQ #0 OR DSLEN2 EQ #0 THEN
025014  005737  000512                                                                TST     DSLEN1
025020  001403                                                                      BEQ     $51007
025022  005737  000514                                                              TST     DSLEN2
025026  001003                                                                      BNE     $51010
025030                                                                          $51007:
025030                                    LET CC.EXP := CC.EXP SET.BY #ZBIT
025030  052737  000004  000520                                                      BIS     #ZBIT,CC.EXP
025036                                  ENDIF
025036                                                                          $51010:


                                        ;+
                                        ; PUT THE EXPECTED VALUE OF THE VBIT INTO CC.EXP
                                        ;-

025036                                  IF DSLEN1 HI DSLEN2 THEN                ;SRC.LEN > DST.LEN
025036  023737  000512  000514                                                          CMP     DSLEN1,DSLEN2
025044  101403                                                                      BLOS    $51011
025046                                    LET CC.EXP := CC.EXP SET.BY #VBIT
025046  052737  000002  000520                                                      BIS     #VBIT,CC.EXP
025054                                  ENDIF
```

```
 7287  025054                                                                                $51011:
 7288
 7289
 7290                                  ;+
 7291                                  ; SAVE THE FIRST AND LAST BYTES OF THE EXPECTED DESTINATION
 7292                                  ; IN DSTMP0 AND DSTMP1.
 7293                                  ;-
 7294
 7295  025054                          LET DSTMP0 := DS.EXP
 7296  025054  013737  062536  000552                                                        MOV     DS.EXP,DSTMP0
 7297  025062                          LET R0 := #DS.EXP + DATA02 - #1
 7298  025062  012700  062536                                                               MOV     #DS.EXP,R0
 7299  025066  063700  000564                                                               ADD     DATA02,R0
 7300  025072  005300                                                                       DEC     R0
 7301  025074                          LET DSTMP1 :B= (R0)
 7302  025074  111037  000553                                                               MOVB    (R0),DSTMP1
 7303
 7304
 7305                                  ;+
 7306                                  ; DO THE CVTPN INSTRUCTION, CONVERTING EACH PACKED SOURCE
 7307                                  ; STRING INTO ALL SIX NUMERIC DATA TYPES.  DS.EXP WILL HAVE
 7308                                  ; TO BE ALTERED FOR EACH DATA TYPE.
 7309                                  ;-
 7310
 7311                                  ;INCR DATTYP FROM #0 TO #50000 BY #10000
 7312  025100                          INLINE   <CLR DATTYP>
 7313  025100  005037  000462                                                               CLR     DATTYP
 7314  025104                          INLINE   <BR  $5402>
 7315  025104  000412                                                                       BR      $5402
 7316  025106                          INLINE   <$5401:>
 7317  025106                                                                               $5401:
 7318
 7319                                  ;CLEAR THE DESTINATION BUFFER
 7320
 7321  025106                          LET R0 := #DS.DST-1
 7322  025106  012700  062473                                                               MOV     #DS.DST-1,R0
 7323  025112                          WHILE R0 LOS #DS.DST+37 DO
 7324  025112                                                                       $51012:
 7325  025112  020027  062533                                                               CMP     R0,#DS.DST+37
 7326  025116  101002                                                                       BHI     $51013
 7327  025120
 7328  025120  105020                    LET (R0)+ :B= #0                                   CLRB    (R0)+
 7329  025122                          ENDDO
 7330  025122  000773                                                                       BR      $51012
 7331  025124                                                                       $51013:
 7332
 7333                                  ;INCREMENT DATTYP
 7334
 7335  025124                          LET DATTYP := DATTYP + #10000
 7336  025124  062737  010000  000462                                                       ADD     #10000,DATTYP
 7337  025132                          INLINE   <$5402:>
 7338  025132                                                                               $5402:
 7339  025132                          IF DATTYP HI #50000 THEN
 7340  025132  023727  000462  050000                                                       CMP     DATTYP,#50000
 7341  025140  101402                                                                       BLOS    $5014
 7342  025142                            INLINE   <JMP        $5403>
```

```
 7343  025142  000137  026044                                                          JMP     $5403
 7344  025146                        ENDIF
 7345  025146                                                                  $51014:
 7346
 7347                                ;RESTORE FIRST AND LAST BYTES OF DESTINATION
 7348
 7349  025146                        LET DS.EXP :B= DSTMP0
 7350  025146  113737  000552  062536                                                  MOVB    DSTMP0,DS.EXP
 7351  025154                        IF DATA02 NE #0 THEN
 7352  025154  005737  000564                                                         TST     DATA02
 7353  025160  001406                                                                 BEQ     $51015
 7354  025162                          LET R0 := #DS.EXP-1 + DATA02
 7355  025162  012700  062535                                                        MOV     #DS.EXP-1,R0
 7356  025166  063700  000564                                                        ADD     DATA02,R0
 7357  025172
 7358  025172  113710  000553           LET (R0) :B= DSTMP1                          MOVB    DSTMP1,(R0)
 7359  025176                        ENDIF
 7360  025176                                                                  $51015:
 7361
 7362
 7363  025176                        ;*** SIGNED ZONED ***
 7364  025176  005737  000462        IF DATTYP EQ #0 THEN                             TST     DATTYP
 7365  025202  001022                                                                 BNE     $51016
 7366  025204
 7367  025204  105037  062535          LET DS.EXP-1 :B= #0           ;RESTORE AFTER LEADING SEPARATE
                                                                                      CLRB    DS.EXP-1
 7368  025210
 7369  025210  005737  000564          IF DATA02 HI #0 THEN          ;DST.LEN > 0
                                                                                      TST     DATA02
 7370  025214  101415                                                                 BLOS    $51017
 7371  025216
 7372  025216  012700  062535            LET R0 := #DS.EXP-1 + DATA02
                                                                                      MOV     #DS.EXP-1,R0
 7373  025222  063700  000564                                                        ADD     DATA02,R0
 7374  025226
 7375  025226  032737  000010  000520      IF #NBIT NOTSETIN CC.EXP THEN      ;SIGN IS +
                                                                                      BIT     #NBIT,CC.EXP
 7376  025234  001003                                                                 BNE     $51020
 7377  025236
 7378  025236  152710  000060              LET (R0) :B= (R0) SET.BY #60
                                                                                      BISB    #60,(R0)
 7379  025242                            ELSE                              ;SIGN IS -
 7380  025242  000402                                                                 BR      $51021
 7381  025244                                                                  $51020:
 7382  025244
 7383  025244  152710  000160              LET (R0) :B  (R0) SET.BY #160
                                                                                      BISB    #160,(R0)
 7384  025250                            ENDIF
 7385  025250                                                                  $51021:
 7386  025250                          ENDIF
 7387  025250                                                                  $51017:
 7388  025250                        ENDIF
 7389  025250                                                                  $51016:
 7390
 7391                                ;*** UNSIGNED ZONED ***
 7392  025250                        IF DATTYP EQ #10000 THEN
 7393  025250  023727  000462  010000                                                 CMP     DATTYP,#10000
 7394  025256  001014                                                                 BNE     $51022
 7395  025260
 7396  025260  005737  000564          IF DATA02 HI #0 THEN          ;DST.LEN > 0
                                                                                      TST     DATA02
 7397  025264  101406                                                                 BLOS    $51023
 7398  025266                            LET R0 :- #DS.EXP-1 + DATA02
```

```
7399  025266  012700  062535                                                        MOV     #DS.EXP-1,R0
7400  025272  063700  000564                                                        ADD     DATA02,R0
7401  025276                        LET (R0) :B= (R0) SET.BY #60      ;PUT IN UNSIGNED 'SIGN'
7402  025276  152710  000060                                                        BISB    #60,(R0)
7403  025302                      ENDIF
7404  025302                                                                  $51023:
7405  025302                      LET CC.EXP := CC.EXP CLR.BY #NBIT
7406  025302  042737  000010  000520                                              BIC     #NBIT,CC.EXP
7407  025310                    ENDIF
7408  025310                                                                  $51022:
7409
7410                            ;*** TRAILING OVERPUNCH ***
7411  025310                    IF DATTYP EQ #20000 THEN
7412  025310  023727  000462  020000                                            CMP     DATTYP,#20000
7413  025316  001047                                                            BNE     $51024
7414  025320                      IF DSLEN2 HI #0 AND SIGN0 EQ #-1 THEN
7415  025320  005737  000514                                                    TST     DSLEN2
7416  025324  101407                                                            BLOS    $51025
7417  025326  023727  000446  177777                                            CMP     SIGN0,#-1
7418  025334  001003                                                            BNE     $51025
7419  025336                        LET CC.EXP := CC.EXP SET.BY #NBIT
7420  025336  052737  000010  000520                                            BIS     #NBIT,CC.EXP
7421  025344                      ENDIF
7422  025344                                                                  $51025:
7423  025344                      IF DATA02 HI #0 THEN              ;DST.LEN > 0
7424  025344  005737  000564                                                    TST     DATA02
7425  025350  101432                                                            BLOS    $51026
7426  025352                        IF DSLEN1 NE #0 AND SIGN0 EQ #-1 THEN
7427  025352  005737  000512                                                    TST     DSLEN1
7428  025356  001407                                                            BEQ     $51027
7429  025360  023727  000446  177777                                            CMP     SIGN0,#-1
7430  025366  001003                                                            BNE     $51027
7431  025370                          LET CC.EXP := CC.EXP SET.BY #NBIT
7432  025370  052737  000010  000520                                            BIS     #NBIT,CC.EXP
7433  025376                        ENDIF
7434  025376                                                                  $51027:
7435  025376                        LET R0 := #DS.EXP-1 + DATA02      ;POINT TO LAST DST BYTE
7436  025376  012700  062535                                                    MOV     #DS.EXP-1,R0
7437  025402  063700  000564                                                    ADD     DATA02,R0
7438  025406                        LET R1 :B= DSTMP1 CLR.BY #60              ;GET LSD
7439  025406  113701  000553                                                    MOVB    DSTMP1,R1
7440  025412  142701  000060                                                    BICB    #60,R1
7441  025416                        IF SIGN0 EQ #-1 THEN
7442  025416  023727  000446  177777                                            CMP     SIGN0,#-1
7443  025424  001002                                                            BNE     $51030
7444  025426                          LET R1 := R1 + #10.             ;FORM OVPNCH TABLE OFFSET
7445  025426  062701  000012                                                    ADD     #10.,R1
7446  025432                        ENDIF
7447  025432                                                                  $51030:
7448  025432                        LET (R0) :B= OVPNCH(R1)           ;GET CORRECT SIGN/DIGIT
7449  025432  116110  055254                                                    MOVB    OVPNCH(R1),(R0)
7450  025436                      ENDIF
7451  025436                                                                  $51026:
7452  025436                    ENDIF
7453  025436                                                                  $51024:
7454
```

```
7455
7456  025436                                    ;*** LEADING OVERPUNCH ***
7457  025436  023727  000462  030000            IF DATTYP EQ #30000 THEN
7458  025444  001020                                                                    CMP     DATTYP,#30000
7459  025446                                                                            BNE     $51037
7460  025446  005737  000564                      IF DATA02 HI #0 THEN                ;DST.LEN > 0
7461  025452  101415                                                                    TST     DATA02
7462  025454                                                                            BLOS    $51032
7463  025454  113701  000552                        LET R1 :B= DSTMP0 CLR.BY #60              ;GET MSD
7464  025460  142701  000060                                                          MOVB    DSTMP0,R1
7465  025464                                                                          BICB    #60,R1
7466  025464  032737  000010  000520                IF #NBIT SETIN CC.EXP THEN
7467  025472  001402                                                                  BIT     #NBIT,CC.EXP
7468  025474                                                                          BEQ     $51033
7469  025474  062701  000012                          LET R1 := R1 + #10.             ;FORM OVPNCH TABLE OFFSET
7470  025500                                                                          ADD     #10.,R1
7471  025500                                        ENDIF                                   $51033:
7472  025500                                                                          ;GET CORRECT SIGN/DIGIT
7473  025500  116137  055254  062536                LET DS.EXP :B- OVPNCH(R1)
7474  025506                                                                          MOVB    OVPNCH(R1),DS.EX
7475  025506                                      ENDIF                                     $51032:
7476  025506                                                                                  $51031:
7477  025506                                    ENDIF
7478
7479                                            ;*** TRAILING SEPARATE ***
7480  025506                                    IF DATTYP EQ #40000 THEN
7481  025506  023727  000462  040000                                                  CMP     DATTYP,#40000
7482  025514  001015                                                                  BNE     $51034
7483  025516                                        LET R0 := #DS.EXP + DATA02
7484  025516  012700  062536                                                          MOV     #DS.EXP,R0
7485  025522  063700  000564                                                          ADD     DATA02,R0
7486  025526                                        IF #NBIT NOTSETIN CC.EXP THEN             ;SIGN IS +
7487  025526  032737  000010  000520                                                  BIT     #NBIT,CC.EXP
7488  025534  001003                                                                  BNE     $51035
7489  025536                                          LET (R0) :B- #53
7490  025536  112710  000053                                                        MOVB    #53,(R0)
7491  025542                                        ELSE                        ;SIGN IS -
7492  025542  000402                                                                  BR      $51036
7493  025544                                                                                  $51035:
7494  025544                                          LET (R0) :B- #55
7495  025544  112710  000055                                                        MOVB    #55,(R0)
7496  025550                                        ENDIF
7497  025550                                                                                  $51036:
7498  025550                                    ENDIF                                         $51034:
7499  025550
7500
7501                                            ;*** LEADING SEPARATE ***
7502  025550                                    IF DATTYP EQ #50000 THEN
7503  025550  023727  000462  050000                                                  CMP     DATTYP,#50000
7504  025556  001020                                                                  BNE     $51037
7505  025560                                        LET R0 :  #DS.EXP + DATA02
7506  025560  012700  062536                                                          MOV     #DS.EXP,R0
7507  025564  063700  000564                                                          ADD     DATA02,R0
7508  025570                                        LET (R0) :B- #0             ;RESTORE AFTER TRAILING SEPARATE
7509  025570  105010                                                                  CLRB    (R0)
7510  025572                                        IF #NBIT NOTSETIN CC.EXP THEN             ;SIGN = +
```

```
7511  025572 032737 000010 000520                                                    BIT     #NBIT,CC.EXP
7512  025600 001004                                                                  BNE     $51040
7513  025602                          LET DS.EXP-1 :B= #53
7514  025602 112737 000053 062535                                                    MOVB    #53,DS.EXP-1
7515  025610                        ELSE                              ;SIGN = -
7516  025610 000403                                                                  BR      $51041
7517  025612                                                                 $51040:
7518  025612                          LET DS.EXP-1 :B= #55
7519  025612 112737 000055 062535                                                    MOVB    #55,DS.EXP-1
7520  025620                        ENDIF
7521  025620                                                                 $51041:
7522  025620                      ENDIF
7523  025620                                                                 $51037:
7524
7525                              ;+
7526                              ; SET UP R2.EXP, R0, R1, R2, AND R3; DO THE INSTRUCTION.
7527                              ;-
7528
7529  025620                      LET R0 := DATA00                  ;SRC  DATA TYPE AND LENGTH
7530  025620 013700 000560                                                           MOV     DATA00,R0
7531  025624                      LET R1 := DATA01                  ;SRC  POINTER
7532  025624 013701 000562                                                           MOV     DATA01,R1
7533  025630                      LET R2 := DATA02 + DATTYP         ;DST DATA TYPE AND LENGTH
7534  025630 013702 000564                                                           MOV     DATA02,R2
7535  025634 063702 000462                                                           ADD     DATTYP,R2
7536  025640                      LET R3 := #DS.DST                 ;DST POINTER
7537  025640 012703 062474                                                           MOV     #DS.DST,R3
7538  025644                      LET R2.EXP := R2
7539  025644 010237 000526                                                           MOV     R2,R2.EXP
7540  025650                      INLINE  <CVTPN>
7541  025650 076054                                                                  CVTPN
7542
7543
7544                              ;+
7545                              ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
7546                              ;-
7547
7548  025652                      LET CC := PSW
7549  025652 013737 177776 000516                                                    MOV     PSW,CC
7550  025660                      LET CC := CC CLR.BY #177760
7551  025660 042737 177760 000516                                                    BIC     #177760,CC
7552  025666                      IF CC NE CC.EXP THEN
7553  025666 023737 000516 000520                                                    CMP     CC,CC.EXP
7554  025674 001402                                                                  BEQ     $51042
7555  025676                        CALL ERROR
7556  025676 004737 056274                                                           JSR     PC,ERROR
7557  025702                      ENDIF
7558  025702                                                                 $51042:
7559  025702                      IF R0 NE R0.EXP THEN
7560  025702 020037 000522                                                           CMP     R0,R0.EXP
7561  025706 001402                                                                  BEQ     $51043
7562  025710                        CALL ERROR
7563  025710 004737 056274                                                           JSR     PC,ERROR
7564  025714                      ENDIF
7565  025714                                                                 $51043:
7566  025714                      IF R1 NE R1.EXP THEN
```

```
7567  025714  020137  00C524                                          CMP     R1,R1.EXP
7568  025720  001402                                                  BEQ     $51044
7569  025722                        CALL ERROR
7570  025722  004737  056274                                          JSR     PC,ERROR
7571  025726                        ENDIF
7572  025726                                                        $51044:
7573  025726                        IF R2 NE R2.EXP THEN
7574  025726  020237  000526                                          CMP     R2,R2.EXP
7575  025732  001402                                                  BEQ     $51045
7576  025734                        CALL ERROR
7577  025734  004737  056274                                          JSR     PC,ERROR
7578  025740                        ENDIF
7579  025740                                                        $51045:
7580  025740                        IF R3 NE R3.EXP THEN
7581  025740  020337  000530                                          CMP     R3,R3.EXP
7582  025744  001402                                                  BEQ     $51046
7583  025746                        CALL ERROR
7584  025746  004737  056274                                          JSR     PC,ERROR
7585  025752                        ENDIF
7586  025752                                                        $51046:
7587  025752                        IF R4 NE R4.EXP THEN
7588  025752  020437  000532                                          CMP     R4,R4.EXP
7589  025756  001402                                                  BEQ     $51047
7590  025760                        CALL ERROR
7591  025760  004737  056274                                          JSR     PC,ERROR
7592  025764                        ENDIF
7593  025764                                                        $51047:
7594  025764                        IF R5 NE R5.EXP THEN
7595  025764  020537  000534                                          CMP     R5,R5.EXP
7596  025770  001402                                                  BEQ     $51050
7597  025772                        CALL ERROR
7598  025772  004737  056274                                          JSR     PC,ERROR
7599  025776                        ENDIF
7600  025776                                                        $51050:
7601
7602
7603  025776                        ;COMPARE DS.DST WITH DS.EXP
7604  025776  012700  062535        LET R0 := #DS.EXP-1                     MOV     #DS.EXP-1,R0
7605  026002
7606  026002  012701  062473        LET R1 := #DS.DST-1                     MOV     #DS.DST-1,R1
7607  026006
7608  026006  005037  000454        LET ERRFLG := #0                ;CLEAR THE ERROR FLAG
                                                                              CLR     ERRFLG
7609  026012                        WHILE R0 NE #DS.EXP+40 AND ERRFLG EQ #0 DO
7610  026012                                                        $51051:
7611  026012  020027  062576                                          CMP     R0,#DS.EXP+40
7612  026016  001410                                                  BEQ     $51052
7613  026020  005737  000454                                          TST     ERRFLG
7614  026024  001005                                                  BNE     $51052
7615  026026
7616  026026  122021                  IFB (R0)+ NE (R1)+ THEN                 CMPB    (R0)+,(R1)+
7617  026030  001402                                                  BEQ     $51053
7618  026032
7619  026032  004737  056274            CALL ERROR                            JSR     PC,ERROR
7620  026036
7621  026036                          ENDIF                                 $51053:
7622  026036                        ENDDO
```

```
 7623  026036  000765                                                          BR      $51051
 7624  026040                                                          $51052:
 7625                          ;ENDINC
 7626  026040                  INLINE  <JMP  $5401>
 7627  026040  000137  025106                                                 JMP  $5401
 7628  026044                  INLINE  <$5403:>
 7629  026044                                                                 $5403:
 7630
 7631  026044                  LET TSTCAS := TSTCAS + #6
 7632  026044  062737  000006  000542                                         ADD     #6,TSTCAS
 7633  026052                  LET COUNT := COUNT - #1
 7634  026052  005337  000466                                                 DEC     COUNT
 7635                          ;UNTIL COUNT EQ #0
 7636  026056                  IF COUNT NE #0 THEN
 7637  026056  005737  000466                                                 TST     COUNT
 7638  026062  001402                                                         BEQ     $51054
 7639  026064
 7640  026064  000137  024372  INLINE  <JMP  $5054>                           JMP  $5054
 7641  026070                  ENDIF
 7642  026070                                                          $51054:
 7643                          ;+
 7644                          ; DO ONE INLINE CASE - CVTPNI
 7645                          ;-
 7646
 7647  026070                  CALL CLRREG
 7648  026070  004737  055330                                                 JSR     PC,CLRREG
 7649  026074                  CALL CLRDSB
 7650  026074  004737  055520                                                 JSR     PC,CLRDSB
 7651  026100                  INLINE  <CVTPNI>
 7652  026100  076154                                                         CVTPNI
 7653  026102                  INLINE  <.WORD  TCVPNI>
 7654  026102  026416                                                         .WORD   TCVPNI
 7655  026104                  INLINE  <.WORD  TCVPNI+4>
 7656  026104  026422                                                         .WORD   TCVPNI+4
 7657  026106                  LET CC := PSW
 7658  026106  013737  177776  000516                                         MOV     PSW,CC
 7659  026114                  LET CC := CC CLR.BY #177760
 7660  026114  042737  177760  000516                                         BIC     #177760,CC
 7661  026122                  IF CC NE #10 THEN
 7662  026122  023727  000516  000010                                         CMP     CC,#10
 7663  026130  001402                                                         BEQ     $51055
 7664  026132
 7665  026132  004737  056274    CALL ERROR                                  JSR     PC,ERROR
 7666  026136                  ENDIF
 7667  026136                                                          $51055:
 7668  026136                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
 7669  026136  005700                                                         TST     R0
 7670  026140  001004                                                         BNE     $51056
 7671  026142  005701                                                         TST     R1
 7672  026144  001002                                                         BNE     $51056
 7673  026146  005702                                                         TST     R2
 7674  026150  001402                                                         BEQ     $51057
 7675  026152                                                          $51056:
 7676  026152
 7677  026152  004737  056274    CALL ERROR                                  JSR     PC,ERROR
 7678  026156                  ENDIF
```

```
 7679  026156                          IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
 7680  026156                                                                          $51057:
 7681  026156  005703                                                                         TST     R3
 7682  026160  001004                                                                         BNE     $51060
 7683  026162  005704                                                                         TST     R4
 7684  026164  001002                                                                         BNE     $51060
 7685  026166  005705                                                                         TST     R5
 7686  026170  001402                                                                         BEQ     $51061
 7687  026172                                                                          $51060:
 7688  026172                            CALL ERROR
 7689  026172  004737  056274                                                               JSR     PC,ERROR
 7690  026176                          ENDIF
 7691  026176                                                                          $51061:
 7692  026176                          IFB DS.DST NE #61 THEN
 7693  026176  123727  062474  000061                                                       CMPB    DS.DST,#61
 7694  026204  001402                                                                      BEQ     $51062
 7695  026206                            CALL ERROR
 7696  026206  004737  056274                                                               JSR     PC,ERROR
 7697  026212                          ENDIF
 7698  026212                                                                          $51062:
 7699  026212                          IFB DS.DST+1 NE #62 THEN
 7700  026212  123727  062475  000062                                                       CMPB    DS.DST+1,#62
 7701  026220  001402                                                                      BEQ     $51063
 7702  026222                            CALL ERROR
 7703  026222  004737  056274                                                               JSR     PC,ERROR
 7704  026226                          ENDIF
 7705  026226                                                                          $51063:
 7706  026226                          IFB DS.DST+2 NE #63 THEN
 7707  026226  123727  062476  000063                                                       CMPB    DS.DST+2,#63
 7708  026234  001402                                                                      BEQ     $51064
 7709  026236                            CALL ERROR
 7710  026236  004737  056274                                                               JSR     PC,ERROR
 7711  026242                          ENDIF
 7712  026242                                                                          $51064:
 7713  026242                          IFB DS.DST+3 NE #164 THEN
 7714  026242  123727  062477  000164                                                       CMPB    DS.DST+3,#164
 7715  026250  001402                                                                      BEQ     $51065
 7716  026252                            CALL ERROR
 7717  026252  004737  056274                                                               JSR     PC,ERROR
 7718  026256                          ENDIF
 7719  026256                                                                          $51065:
 7720  026256                          INLINE  <JMP  XCVTNP>
 7721  026256  000137  026432                                                               JMP  XCVTNP
 7722
 7723
 7724
 7725                                  ;+
 7726                                  ; TABLE OF TEST CASES FOR CVTPN
 7727                                  ;-
 7728
 7729  026262  000011                  TCVTPN: .WORD   9.              ;# OF TEST CASES FOR CVTPN
 7730
 7731  026264  060000                          .WORD   60000                   ;SRC DATA TYPE AND LENGTH
 7732  026266  026352                          .WORD   CVTPN1                  ;POINTER TO PACKED SRC STRING
 7733  026270  000000                          .WORD   0                       ;DST.LEN
 7734
```

```
 7735  026272  060000                          .WORD   60000           ;TEST CASE NUMBER 2
 7736  026274  026353                          .WORD   CVTPN2
 7737  026276  000005                          .WORD   5
 7738
 7739  026300  060004                          .WORD   60004           ;TEST CASE NUMBER 3
 7740  026302  026354                          .WORD   CVTPN3
 7741  026304  000000                          .WORD   0
 7742
 7743
 7744  026306  060025                          .WORD   60025           ;TEST CASE NUMBER 4
 7745  026310  026357                          .WORD   CVTPN4
 7746  026312  000014                          .WORD   14
 7747
 7748  026314  060007                          .WORD   60007           ;TEST CASE NUMBER 5
 7749  026316  026372                          .WORD   CVTPN5
 7750  026320  000003                          .WORD   3
 7751
 7752  026322  070007                          .WORD   70007           ;TEST CASE NUMBER 6
 7753  026324  026376                          .WORD   CVTPN6
 7754  026326  000003                          .WORD   3
 7755
 7756  026330  060004                          .WORD   60004           ;TEST CASE NUMBER 7
 7757  026332  026402                          .WORD   CVTPN7
 7758  026334  000037                          .WORD   37
 7759
 7760  026336  060012                          .WORD   60012           ;TEST CASE NUMBER 8
 7761  026340  026405                          .WORD   CVTPN8
 7762  026342  000012                          .WORD   12
 7763
 7764  026344  060005                          .WORD   60005           ;TEST CASE NUMBER 9
 7765  026346  026413                          .WORD   CVTPN9
 7766  026350  000005                          .WORD   5
 7767
 7768
 7769
 7770  026352      014                 CVTPN1: .BYTE   014                     ;PACKED DECIMAL STRING 1
 7771
 7772  026353      015                 CVTPN2: .BYTE   015                     ;PACKED DECIMAL STRING 2
 7773
 7774  026354      001     043     114 CVTPN3: .BYTE   001,043,114             ;PACKED DECIMAL STRING 3
 7775
 7776  026357      020     043     127 CVTPN4: .BYTE   020,043,127,206,224,022,003,000,100,000,014     ;PACKED DECIMAL STRING 4
 7777  026362      206     224     022
 7778  026365      003     000     100
 7779  026370      000     014
 7780
 7781  026372      022     000     007 CVTPN5: .BYTE   022,000,007,055         ;PACKED DECIMAL STRING 5
 7782  026375      055
 7783
 7784  026376      022     000     007 CVTPN6: .BYTE   022,000,007,055         ;PACKED DECIMAL STRING 6
 7785  026401      055
 7786
 7787  026402      001     043     114 CVTPN7: .BYTE   001,043,114             ;PACKED DECIMAL STRING 7
 7788
 7789  026405      002     024     164 CVTPN8: .BYTE   002,024,164,203,144,215         ;PACKED DECIMAL STRING 8
 7790  026410      203     144     215
```

```
 7791
 7792  026413      061      040      174  CVTPN9: .BYTE   061,040,174             ;PACKED DECIMAL STRING 9
 7793
 7794
 7795
 7796                                       .EVEN
 7797
 7798  026416                               TCVPNI:                                 ;INLINE TEST CASE
 7799  026416  060004                               .WORD   060004                          ;SIGNED PACKED, LENGTH - 4
 7800  026420  026426                               .WORD   PN1                             ;POINTER TO PACKED SRC STRING
 7801  026422  000004                               .WORD   000004                          ;SIGNED ZONED, LENGTH = 4
 7802  026424  062474                               .WORD   DS.DST                          ;POINTER TO DST
 7803
 7804  026426      001      043      113  PN1:    .BYTE   1,43,113                        ;-1234
 7805          026432                               .EVEN
```

```
7806                                    .SBTTL  CVTNP
7807                                    ;;*****************************************************************
7808                                    ;
7809                                    ;  CVTNP TEST
7810                                    ;
7811                                    ;;*****************************************************************
7812  026432                            INLINE  <XCVTNP:>
7813  026432                                                                          XCVTNP:
7814  026432                            INLINE  <SCOPE>
7815  026432  000004                                                                 SCOPE
7816  026434                            LET $TIMES := #20             ;ITERATION COUNT
7817  026434  012737  000020  000404                                                 MOV     #20,$TIMES
7818  026442                            LET COUNT := TCVTNP           ;GET TEST COUNT
7819  026442  013737  030126  000466                                                 MOV     TCVTNP,COUNT
7820  026450                            LET TSTCAS := #TCVTNP+2       ;POINT TO FIRST TEST CASE
7821  026450  012737  030130  000542                                                 MOV     #TCVTNP+2,TSTCAS
7822                                    ;REPEAT
7823  026456                            INLINE  <$5055:>
7824  026456                                                                          $5055:
7825
7826                                      ;+
7827                                      ; GET TEST DATA FROM TABLE
7828                                      ;-
7829
7830  026456                              LET R0 := TSTCAS
7831  026456  013700  000542                                                       MOV     TSTCAS,R0
7832  026462                              LET DATA00 := (R0)+         ;SRC DATA TYPE AND LENGTH
7833  026462  012037  000560                                                       MOV     (R0)+,DATA00
7834  026466                              LET DATA01 := (R0)+         ;POINTER TO INTERMEDIATE SRC STRING
7835  026466  012037  000562                                                       MOV     (R0)+,DATA01
7836  026472                              LET DATA02 := (R0)          ;DST DATA TYPE AND LENGTH
7837  026472  011037  000564                                                       MOV     (R0),DATA02
7838
7839
7840                                      ;+
7841                                      ; INITIALIZE THE DECIMAL BUFFERS AND CC.EXP.
7842                                      ;-
7843
7844  026476                              CALL CLRDSB
7845  026476  004737  055520                                                       JSR     PC,CLRDSB
7846  026502                              LET CC.EXP :- #0
7847  026502  005037  000520                                                       CLR     CC.EXP
7848
7849
7850                                      ;+
7851                                      ; LET SIGNO REFLECT THE SIGN OF THE SOURCE STRING.
7852                                      ;-
7853
7854  026506                              LET SIGNO := @DATA01
7855  026506  017737  152050  000446                                               MOV     @DATA01,SIGNO
7856
7857
7858                                      ;+
7859                                      ; PUT SRC MAGNITUDE INTO DSBUF1.  DSBUF1 WILL BE THE SOURCE FOR THE
7860                                      ; CVTNP INSTRUCTION.
7861                                      ;-
```

```
7862
7863  026514
7864  026514  004737  055520                  CALL CLRDSB                                                     JSR     PC,CLRDSB
7865  026520
7866  026520  013700  000562                  LET R0 := DATA01                ;GET ADDRESS OF INTERMEDIATE SRC. STRING
                                                                                                              MOV     DATA01,R0
7867  026524
7868  026524  062700  000002                  LET R0 := R0 + #2               ;GET PAST THE SIGN WORD
                                                                                                              ADD     #2,R0
7869  026530
7870  026530  012701  062370                  LET R1 := #DSBUF1
                                                                                                              MOV     #DSBUF1,R1
7871  026534
7872  026534  013737  000560  000512          LET DSLEN1 := DATA00 CLR.BY #70000    ;GET SRC.LEN
                                                                                                              MOV     DATA00,DSLEN1
7873  026542  042737  070000  000512
                                                                                                              BIC     #70000,DSLEN1
7874  026550
7875  026550  012702  000001                  INCR R2 FROM #1 TO DSLEN1 BY #1       ;TRANSFER THE MAGNITUDE
                                                                                                              MOV     #1,R2
7876  026554  000401                                                                                         BR      $51066
7877  026556                                                                                        $51067:
7878  026556  005202                                                                                         INC     R2
7879  026560                                                                                       $51066:
7880  026560  020237  000512                                                                                 CMP     R2,DSLEN1
7881  026564  003002                                                                                         BGT     $51070
7882  026566
7883  026566  112021                            LET (R1)+ :B= (R0)+
                                                                                                              MOVB    (R0)+,(R1)+
7884  026570
7885  026570  000772                          ENDINC
                                                                                                              BR      $51067
7886  026572                                                                                        $51070:
7887
7888
7889                                           ;+
7890                                           ; PUT THE PROPER SIGN INTO DSBUF1, ACCORDING TO THE SOURCE DATA TYPE.
7891                                           ;-
7892
7893  026572
7894  026572  013737  000560  000462          LET DATTYP :- DATA00 CLR.BY #107777   ;GET SRC DATA TYPE
                                                                                                              MOV     DATA00,DATTYP
7895  026600  042737  107777  000462
                                                                                                              BIC     #107777,DATTYP
7896
7897
7898                                           ;*** SIGNED ZONED ***
7899  026606                                   IF DATTYP EQ #0 THEN
7900  026606  005737  000462                                                                                 TST     DATTYP
7901  026612  001014                                                                                         BNE     $51071
7902  026614
7903  026614  005737  000512                    IF DSLEN1 HI #0 THEN                ;SRC.LEN > 0
7904  026620  101411                                                                                         TST     DSLEN1
7905  026622                                                                                                BLOS    $51072
7906  026622  005301                              LET R1 := R1 - #1                   ;POINT TO SIGN BYTE
                                                                                                              DEC     R1
7907  026624
7908  026624  005737  000446                      IF SIGN0 EQ #0 THEN                       ;SIGN IS +
7909  026630  001003                                                                                         TST     SIGN0
7910  026632                                                                                                BNE     $51073
7911  026632  152711  000060                        LET (R1) :B= (R1) SET.BY #60
                                                                                                              BISB    #60,(R1)
7912  026636                                     ELSE                                    ;SIGN IS -
7913  026636  000402                                                                                         BR      $51074
7914  026640                                                                                        $51073:
7915  026640                                       LET (R1) :B= (R1) SET.BY #160
                                                                                                              BISB    #160,(R1)
7916  026640  152711  000160
7917  026644                                     ENDIF
```

```
 7918  026644                                                                  $51074:
 7919  026644                          ENDIF
 7920  026644                                                                  $51072:
 7921  026644                        ENDIF
 7922  026644                                                                  $51071:
 7923
 7924
 7925                                ;*** UNSIGNED ZONED ***
 7926  026644                        IF DATTYP EQ #10000 THEN
 7927  026644  023727  000462  010000                                                CMP     DATTYP,#10000
 7928  026652  001006                                                               BNE     $51075
 7929  026654                          IF DSLEN1 HI #0 THEN
 7930  026654  005737  000512                                                       TST     DSLEN1
 7931  026660  101403                                                               BLOS    $51076
 7932  026662                            LET R1 := R1 - #1                 ;POINT TO SIGN BYTE
 7933  026662  005301                                                               DEC     R1
 7934  026664                            LET (R1) :B= (R1) SET.BY #60
 7935  026664  152711  000060                                                       BISB    #60,(R1)
 7936  026670                          ENDIF
 7937  026670                                                                  $51076:
 7938  026670                        ENDIF
 7939  026670                                                                  $51075:
 7940
 7941
 7942                                ;*** TRAILING OVERPUNCH ***
 7943  026670                        IF DATTYP EQ #20000 THEN
 7944  026670  023727  000462  020000                                                CMP     DATTYP,#20000
 7945  026676  001015                                                               BNE     $51077
 7946  026700                          IF DSLEN1 HI #0 THEN
 7947  026700  005737  000512                                                       TST     DSLEN1
 7948  026704  101412                                                               BLOS    $51100
 7949  026706                            LET R1 := R1 - #1                 ;POINT TO SIGN BYTE
 7950  026706  005301                                                               DEC     R1
 7951  026710                              LET R0 := (R1)
 7952  026710  011100                                                               MOV     (R1),R0
 7953  026712                              IF SIGN0 EQ #-1 THEN
 7954  026712  023727  000446  177777                                                CMP     SIGN0,#-1
 7955  026720  001002                                                               BNE     $51101
 7956  026722                                LET R0 := R0 + #10.
 7957  026722  062700  000012                                                       ADD     #10.,R0
 7958  026726                              ENDIF
 7959  026726                                                                  $51101:
 7960  026726                              LET (R1) :B- OVPNCH(R0)           ;PUT IN SIGN/DIGIT COMBINATION
 7961  026726  116011  055254                                                       MOVB    OVPNCH(R0),(R1)
 7962  026732                            ENDIF
 7963  026732                                                                  $51100:
 7964  026732                        ENDIF
 7965  026732                                                                  $51077:
 7966
 7967
 7968                                ;*** LEADING OVERPUNCH ***
 7969  026732                        IF DATTYP EQ #30000 THEN
 7970  026732  023727  000462  030000                                                CMP     DATTYP,#30000
 7971  026740  001016                                                               BNE     $51102
 7972  026742                          IF DSLEN1 HI #0 THEN
 7973  026742  005737  000512                                                       TST     DSLEN1
```

```
7974  026746  101413                                                                    BLOS    $51103
7975  026750                                  LET R0 :B= DSBUF1                         MOVB    DSBUF1,R0
7976  026750  113700  062370                 IF SIGN0 EQ #-1 THEN                      CMP     SIGN0,#-1
7977  026754                                                                            BNE     $51104
7978  026754  023727  000446  177777
7979  026762  001002                           LET R0 := R0 + #10.                     ADD     #10.,R0
7980  026764
7981  026764  062700  000012                 ENDIF
7982  026770                                                                  $51104:
7983  026770                                  LET DSBUF1 :B= OVPNCH(R0)                 MOVB    OVPNCH(R0),DSBUF
7984  026770
7985  026770  116037  055254  062370        ENDIF
7986  026776                                                                  $51103:
7987  026776                                ENDIF                             $51102:
7988  026776
7989  026776
7990
7991
7992                                        ;*** TRAILING SEPARATE ***
7993  026776                                IF DATTYP EQ #40000 THEN
7994  026776  023727  000462  040000                                                    CMP     DATTYP,#40000
7995  027004  001010                                                                   BNE     $51105
7996  027006                                  IF SIGN0 EQ #0 THEN             ;SIGN IS +
7997  027006  005737  000446                                                           TST     SIGN0
7998  027012  001003                                                                   BNE     $51106
7999  027014                                    LET (R1) :B= #53                        MOVB    #53,(R1)
8000  027014  112711  000053                 ELSE                            ;SIGN IS -
8001  027020                                                                          BR      $51107
8002  027020  000402                                                         $51106:
8003  027022                                    LET (R1) :B= #55                        MOVB    #55,(R1)
8004  027022
8005  027026  112711  000055                 ENDIF                                    $51107:
8006  027026
8007  027026                                ENDIF                             $51105:
8008  027026
8009  027026
8010
8011
8012                                        ;*** LEADING SEPARATE ***
8013  027026                                IF DATTYP EQ #50000 THEN
8014  027026  023727  000462  050000                                                    CMP     DATTYP,#50000
8015  027034  001012                                                                   BNE     $51110
8016  027036                                  IF SIGN0 EQ #0 THEN             ;SIGN IS +
8017  027036  005737  000446                                                           TST     SIGN0
8018  027042  001004                                                                   BNE     $51111
8019  027044                                    LET DSBUF1-1 :B= #53                    MOVB    #53,DSBUF1-1
8020  027044  112737  000053  062367                                                  BR      $51112
8021  027052                                  ELSE                            ;SIGN IS -
8022  027052  000403                                                         $51111:
8023  027054                                                                          MOVB    #55,DSBUF1-1
8024  027054                                    LET DSBUF1-1 :B  #55
8025  027054  112737  000055  062367                                          $51112:
8026  027062                                  ENDIF
8027  027062                                                                  $51110:
8028  027062                                ENDIF
8029  027062
```

```
                                        ;+
                                        ; LOCATE THE END OF THE EXPECTED DESTINATION, WHERE THE SIGN
                                        ; GOES.  GET THE DESTINATION DATA TYPE.
                                        ;-

027062                                  LET R2 := DATA02 CLR.BY #70000                  ;GET DST.LEN
027062  013702  000564                                                          MOV     DATA02,R2
027066  042702  070000                                                          BIC     #70000,R2
027072                                  INLINE   <ASR R2>
027072  006202                                                                  ASR     R2
027074                                  LET R0 := #DS.EXP + R2
027074  012700  062536                                                          MOV     #DS.EXP,R0
027100  060200                                                                  ADD     R2,R0
027102                                  LET TEMP1 := DATA02 CLR.BY #107777
027102  013737  000564  000476                                                  MOV     DATA02,TEMP1
027110  042737  107777  000476                                                  BIC     #107777,TEMP1


                                        ;+
                                        ; PUT THE SIGN INTO THE EXPECTED DESTINATION.
                                        ;-

027116                                  LET DSLEN1 :- DATA00 CLR.BY #70000              ;GET SRC.LEN
027116  013737  000560  000512                                                  MOV     DATA00,DSLEN1
027124  042737  070000  000512                                                  BIC     #70000,DSLEN1
027132                                  LET DSLEN2 := DATA02 CLR.BY #70000              ;GET DST.LEN
027132  013737  000564  000514                                                  MOV     DATA02,DSLEN2
027140  042737  070000  000514                                                  BIC     #70000,DSLEN2
027146                                  IF DSLEN1 EQ #0 THEN            ;SRC.LEN OR DST.LEN = 0
027146  005737  000512                                                          TST     DSLEN1
027152  001003                                                                  BNE     $51113
027154                                    LET (R0) :B= #14
027154  112710  000014                                                          MOVB    #14,(R0)
027160                                  ELSE                                    ;SRC.LEN & DST.LEN > 0
027160  000414                                                                  BR      $51114
027162                                                                  $51113:
027162                                    IF @DATA01 EQ #0 OR DATTYP EQ #10000 THEN
027162  005777  151374                                                          TST     @DATA01
027166  001404                                                                  BEQ     $51115
027170  023727  000462  010000                                                  CMP     DATTYP,#10000
027176  001003                                                                  BNE     $51116
027200                                                                  $51115:
027200                                      LET (R0) :B= #14            ;SIGN IS +
027200  112710  000014                                                          MOVB    #14,(R0)
027204                                    ELSE
027204  000402                                                                  BR      $51117
027206                                                                  $51116:
027206                                      LET (R0) :B= #15            ;SIGN IS -
027206  112710  000015                                                          MOVB    #15,(R0)
027212                                    ENDIF
027212                                                                  $51117:
027212                                  ENDIF
027212                                                                  $51114:
027212                                  IF TEMP1 EQ #70000 THEN
```

```
 8086  027212  023727  000476  070000                                                          CMP     TEMP1,#70000
 8087  027220  001002                                                                          BNE     $51120
 8088  027222                        LET (R0) :B= #17
 8089  027222  112710  000017                                                                  MOVB    #17,(R0)
 8090  027226                      ENDIF
 8091  027226                                                                          $51120:
 8092
 8093
 8094                              ;+
 8095                              ; PUT THE EXPECTED VALUE OF THE NBIT INTO CC.EXP
 8096                              ;-
 8097
 8098  027226                      IF DATTYP NE #10000 AND TEMP1 NE #70000 THEN
 8099  027226  023727  000462  010000                                                          CMP     DATTYP,#10000
 8100  027234  001415                                                                          BEQ     $51121
 8101  027236  023727  000476  070000                                                          CMP     TEMP1,#70000
 8102  027244  001411                                                                          BEQ     $51121
 8103  027246                        IFB (R0) EQ #15 AND DSLEN2 GT #0 THEN       ;SIGN NIBBLE IN DS.EXP IS NEG.
 8104  027246  121027  000015                                                                  CMPB    (R0),#15
 8105  027252  001006                                                                          BNE     $51122
 8106  027254  005737  000514                                                                  TST     DSLEN2
 8107  027260  003403                                                                          BLE     $51122
 8108  027262                          LET CC.EXP := CC.EXP SET.BY #NBIT
 8109  027262  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
 8110  027270                        ENDIF
 8111  027270                                                                          $51122:
 8112  027270                      ENDIF
 8113  027270                                                                          $51121:
 8114
 8115
 8116                              ;+
 8117                              ; PUT THE EXPECTED VALUE OF THE ZBIT INTO CC.EXP
 8118                              ;-
 8119
 8120  027270                      IF DSLEN1 EQ #0 OR DSLEN2 EQ #0 THEN          ;SRC.LEN OR DST.LEN = 0
 8121  027270  005737  000512                                                                  TST     DSLEN1
 8122  027274  001403                                                                          BEQ     $51123
 8123  027276  005737  000514                                                                  TST     DSLEN2
 8124  027302  001003                                                                          BNE     $51124
 8125  027304                                                                          $51123:
 8126  027304                        LET CC.EXP := CC.EXP SET.BY #ZBIT
 8127  027304  052737  000004  000520                                                          BIS     #ZBIT,CC.EXP
 8128  027312                      ENDIF
 8129  027312                                                                          $51124:
 8130
 8131
 8132                              ;+
 8133                              ; PUT THE EXPECTED VALUE OF THE VBIT INTO CC.EXP
 8134                              ;-
 8135
 8136  027312                      IF DSLEN1 HI DSLEN2 THEN              ;SRC.LEN > DST.LEN
 8137  027312  023737  000512  000514                                                          CMP     DSLEN1,DSLEN2
 8138  027320  101403                                                                          BLOS    $51125
 8139  027322                        LET CC.EXP := CC.EXP SET.BY #VBIT
 8140  027322  052737  000002  000520                                                          BIS     #VBIT,CC.EXP
 8141  027330                      ENDIF
```

```
 8142  027330                                                                                  $51125:
 8143
 8144
 8145                                  ;+
 8146                                  ; CALCULATE THE NUMBER OF CHARACTERS TO BE MOVED INTO DS.EXP;
 8147                                  ; USE R0.
 8148                                  ;-
 8149
 8150  027330                          IF DSLEN2 HIS DSLEN1 THEN             ;DST.LEN >= SRC.LEN
 8151  027330  023737  000514  000512                                                  CMP     DSLEN2,DSLEN1
 8152  027336  103403                                                                 BLO     $51126
 8153  027340                            LET R0 := DSLEN1
 8154  027340  013700  000512                                                         MOV     DSLEN1,R0
 8155  027344                          ELSE                                  ;SRC.LEN > DST.LEN
 8156  027344  000402                                                                 BR      $51127
 8157  027346                                                                $51126:
 8158  027346                            LET R0 := DSLEN2
 8159  027346  013700  000514                                                         MOV     DSLEN2,R0
 8160  027352                          ENDIF
 8161  027352                                                                $51127:
 8162
 8163
 8164                                  ;+
 8165                                  ; MAKE R1 POINT TO THE END OF THE DESTINATION IN DS.EXP; MAKE
 8166                                  ; R2 POINT TO THE END OF THE SOURCE IN THE TABLE OF TEST CASES.
 8167                                  ;-
 8168
 8169  027352                          LET R1 := DSLEN2
 8170  027352  013701  000514                                                         MOV     DSLEN2,R1
 8171  027356                          INLINE   <ASR R1>
 8172  027356  006201                                                                 ASR     R1
 8173  027360                          LET R1 := R1 + #DS.EXP
 8174  027360  062701  062536                                                         ADD     #DS.EXP,R1
 8175  027364                          LET R2 := DATA01 + DSLEN1 + #1
 8176  027364  013702  000562                                                         MOV     DATA01,R2
 8177  027370  063702  000512                                                         ADD     DSLEN1,R2
 8178  027374  005202                                                                 INC     R2
 8179
 8180
 8181                                  ;+
 8182                                  ; MOVE THE LEAST SIGNIFICANT BCD FROM THE SOURCE TO THE
 8183                                  ; EXPECTED DESTINATION BUFFER, IN PACKED FORMAT.
 8184                                  ;-
 8185
 8186  027376                          IF R0 GT #0 THEN
 8187  027376  005700                                                                 TST     R0
 8188  027400  003405                                                                 BLE     $51130
 8189  027402                            LET R3 :B= (R2)
 8190  027402  111203                                                                 MOVB    (R2),R3
 8191  027404                            INLINE   <ASH       #4,R3>
 8192  027404  072327  000004                                                         ASH     #4,R3
 8193  027410                            LET (R1) :B= (R1) SET.BY R3
 8194  027410  150311                                                                 BISB    R3,(R1)
 8195  027412                            LET R0 := R0 - #1                   ;DECREMENT COUNT
 8196  027412  005300                                                                 DEC     R0
 8197  027414                          ENDIF
```

```
8198  027414                                                                    $51130:
8199
8200
8201                          ;+
8202                          ; MOVE THE REST OF THE SOURCE TO THE EXPECTED DESTINATION
8203                          ; BUFFER, IN PACKED FORMAT, USING R0 AS A COUNTER FOR THE NUMBER
8204                          ; OF CHARACTERS TO MOVE.
8205                          ;-
8206
8207  027414                  WHILE R0 GT #0 DO
8208  027414                                                                    $51131:
8209  027414  005700                                                                   TST     R0
8210  027416  003417                                                                   BLE     $51132
8211
8212  027420                    LET R1 := R1 - #1           ;DECREMENT DEST. POINTER
8213  027420  005301                                                                   DEC     R1
8214  027422                    LET R2 := R2 - #1           ;DECREMENT SRC. POINTER
8215  027422  005302                                                                   DEC     R2
8216  027424                    LET (R1) :B- (R2) CLR.BY #360       ;PUT BCD INTO LOWER NIBBLE
8217  027424  111211                                                                   MOVB    (R2),(R1)
8218  027426  142711  000360                                                         BICB    #360,(R1)
8219  027432                    LET R0 := R0 - #1           ;DECREMENT COUNT
8220  027432  005300                                                                   DEC     R0
8221  027434                    IF R0 HI #0 THEN
8222  027434  005700                                                                   TST     R0
8223  027436  101406                                                                   BLOS    $51133
8224  027440                      LET R2 := R2 - #1         ;DECREMENT SRC. POINTER
8225  027440  005302                                                                   DEC     R2
8226  027442                      LET R3 :B= (R2)
8227  027442  111203                                                                   MOVB    (R2),R3
8228  027444                      INLINE   <ASH     #4,R3>
8229  027444  072327  000004                                                         ASH     #4,R3
8230  027450                      LET (R1) :B= (R1) SET.BY R3       ;PUT BCD INTO UPPER NIBBLE
8231  027450  150311                                                                   BISB    R3,(R1)
8232  027452                      LET R0 := R0 - #1         ;DECREMENT COUNT
8233  027452  005300                                                                   DEC     R0
8234  027454                    ENDIF
8235  027454                                                                    $51133:
8236  027454                  ENDDO
8237  027454  000757                                                                   BR      $51131
8238  027456                                                                    $51132:
8239
8240
8241                          ;+
8242                          ; SET UP R0-R5 AND R0.EXP-R5.EXP; THEN DO THE CVTNP INSTRUCTION.
8243                          ;-
8244
8245
8246  027456                  LET R0 := DATA00                    ;SRC DATA TYPE AND LENGTH
8247  027456  013700  000560                                                         MOV     DATA00,R0
8248  027462                  LET R1 := #DSBUF1                   ;SRC ADDRESS
8249  027462  012701  062370                                                         MOV     #DSBUF1,R1
8250  027466                  LET R2 := DATA02                    ;DST DATA TYPE AND LENGTH
8251  027466  013702  000564                                                         MOV     DATA02,R2
8252  027472                  LET R3 := #DS.DST                   ;DST ADDRESS
8253  027472  012703  062474                                                         MOV     #DS.DST,R3
```

```
 8254  027476                          LET R4 :- #0                                  CLR     R4
 8255  027476  005004
 8256  027500                          LET R5 := #-1                                 MOV     #-1,R5
 8257  027500  012705  177777
 8258  027504                          LET R0.EXP :- #0                              CLR     R0.EXP
 8259  027504  005037  000522
 8260  027510                          LET R1.EXP := #0                              CLR     R1.EXP
 8261  027510  005037  000524
 8262  027514                          LET R2.EXP := R2                              MOV     R2,R2.EXP
 8263  027514  010237  000526
 8264  027520                          LET R3.EXP :- R3                              MOV     R3,R3.EXP
 8265  027520  010337  000530
 8266  027524                          LET R4.EXP := #0                              CLR     R4.EXP
 8267  027524  005037  000532
 8268  027530                          LET R5.EXP :- #-1                             MOV     #-1,R5.EXP
 8269  027530  012737  177777  000534
 8270  027536                          INLINE  <CVTNP>                               CVTNP
 8271  027536  076055
 8272
 8273                                  ;+
 8274                                  ;  CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
 8275                                  ;-
 8276
 8277  027540                          LET CC :  PSW                                 MOV     PSW,CC
 8278  027540  013737  177776  000516
 8279  027546                          LET CC := CC CLR.BY #177760                   BIC     #177760,CC
 8280  027546  042737  177760  000516
 8281  027554                          IF CC NE CC.EXP THEN                          CMP     CC,CC.EXP
 8282  027554  023737  000516  000520
 8283  027562  001402                                                               BEQ     $51134
 8284  027564                            CALL ERROR
 8285  027564  004737  056274                                                      JSR     PC,ERROR
 8286  027570                          ENDIF
 8287  027570                                                                $51134:
 8288  027570                          IF R0 NE R0.EXP THEN                          CMP     R0,R0.EXP
 8289  027570  020037  000522
 8290  027574  001402                                                               BEQ     $51135
 8291  027576                            CALL ERROR
 8292  027576  004737  056274                                                      JSR     PC,ERROR
 8293  027602                          ENDIF
 8294  027602                                                                $51135:
 8295  027602                          IF R1 NE R1.EXP THEN                          CMP     R1,R1.EXP
 8296  027602  020137  000524
 8297  027606  001402                                                               BEQ     $51136
 8298  027610                            CALL ERROR
 8299  027610  004737  056274                                                      JSR     PC,ERROR
 8300  027614                          ENDIF
 8301  027614                                                                $51136:
 8302  027614                          IF R2 NE R2.EXP THEN                          CMP     R2,R2.EXP
 8303  027614  020237  000526
 8304  027620  001402                                                               BEQ     $51137
 8305  027622                            CALL ERROR
 8306  027622  004737  056274                                                      JSR     PC,ERROR
 8307  027626                          ENDIF
 8308  027626                                                                $51137:
 8309  027626                          IF R3 NE R3.EXP THEN
```

```
 8310  027626  020337  000530                                                    CMP     R3,R3.EXP
 8311  027632  001402                                                            BEQ     $51140
 8312  027634
 8313  027634  004737  056274                    CALL ERROR                      JSR     PC,ERROR
 8314  027640                                    ENDIF
 8315  027640                                                            $51140:
 8316  027640                                    IF R4 NE R4.EXP THEN
 8317  027640  020437  000532                                                    CMP     R4,R4.EXP
 8318  027644  001402                                                            BEQ     $51141
 8319  027646
 8320  027646  004737  056274                    CALL ERROR                      JSR     PC,ERROR
 8321  027652                                    ENDIF
 8322  027652                                                            $51141:
 8323  027652                                    IF R5 NE R5.EXP THEN
 8324  027652  020537  000534                                                    CMP     R5,R5.EXP
 8325  027656  001402                                                            BEQ     $51142
 8326  027660
 8327  027660  004737  056274                    CALL ERROR                      JSR     PC,ERROR
 8328  027664                                    ENDIF
 8329  027664                                                            $51142:
 8330
 8331                                            ;COMPARE DS.DST WITH DS.EXP
 8332  027664                                    LET ERRFLG := #0
 8333  027664  005037  000454                                                    CLR     ERRFLG
 8334  027670
 8335  027670  012700  062474                    LET R0 := #DS.DST               MOV     #DS.DST,R0
 8336  027674
 8337  027674  012701  062536                    LET R1 := #DS.EXP               MOV     #DS.EXP,R1
 8338  027700                                    WHILE ERRFLG EQ #0 AND R0 LO #DS.DST+40 DO
 8339  027700                                                            $51143:
 8340  027700  005737  000454                                                    TST     ERRFLG
 8341  027704  001010                                                            BNE     $51144
 8342  027706  020027  062534                                                    CMP     R0,#DS.DST+40
 8343  027712  103005                                                            BHIS    $51144
 8344  027714
 8345  027714  122021                      IFB (R0)+ NE (R1)+ THEN               CMPB    (R0)+,(R1)+
 8346  027716  001402                                                            BEQ     $51145
 8347  027720
 8348  027720  004737  056274                      CALL ERROR                    JSR     PC,ERROR
 8349  027724                                      ENDIF
 8350  027724                                                            $51145:
 8351  027724                                    ENDDO
 8352  027724  000765                                                            BR      $51143
 8353  027726                                                            $51144:
 8354  027726
 8355  027726  062737  000006  000542            LET TSTCAS := TSTCAS + #6      ADD     #6,TSTCAS
 8356  027734
 8357  027734  005337  000466                    LET COUNT := COUNT - #1         DEC     COUNT
 8358                                            ;UNTIL COUNT EQ #0
 8359  027740                                    IF COUNT NE #0 THEN
 8360  027740  005737  000466                                                    TST     COUNT
 8361  027744  001402                                                            BEQ     $51146
 8362  027746
 8363  027746  000137  026456                    INLINE  <JMP  $5055>           JMP  $5055
 8364  027752                                    ENDIF
 8365  027752                                                            $51146:
```

```
 8366
 8367
 8368                                   ;+
 8369                                   ; DO ONE INLINE CASE - CVTNPI
 8370
 8371  027752                           CALL CLRREG                          JSR     PC,CLRREG
 8372  027752  004737  055330
 8373  027756                           CALL CLRDSB                          JSR     PC,CLRDSB
 8374  027756  004737  055520
 8375  027762                           INLINE  <CVTNPI>                     CVTNPI
 8376  027762  076155
 8377  027764                           INLINE  <.WORD  TCVNPI>              .WORD   TCVNPI
 8378  027764  030344
 8379  027766                           INLINE  <.WORD  TCVNPI+4>            .WORD   TCVNPI+4
 8380  027766  030350
 8381  027770                           LET CC := PSW                        MOV     PSW,CC
 8382  027770  013737  177776  000516
 8383  027776                           LET CC := CC CLR.BY #177760          BIC     #177760,CC
 8384  027776  042737  177760  000516
 8385  030004                           IF CC NE #0 THEN                     TST     CC
 8386  030004  005737  000516                                               BEQ     $51147
 8387  030010  001402
 8388  030012                             CALL ERROR                         JSR     PC,ERROR
 8389  030012  004737  056274
 8390  030016                           ENDIF
 8391  030016                                                          $51147:
 8392  030016                           IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
 8393  030016  005700                                                         TST     R0
 8394  030020  001004                                                         BNE     $51150
 8395  030022  005701                                                         TST     R1
 8396  030024  001002                                                         BNE     $51150
 8397  030026  005702                                                         TST     R2
 8398  030030  001402                                                         BEQ     $51151
 8399  030032                                                          $51150:
 8400  030032                             CALL ERROR                         JSR     PC,ERROR
 8401  030032  004737  056274
 8402  030036                           ENDIF
 8403  030036                                                          $51151:
 8404  030036                           IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
 8405  030036  005703                                                         TST     R3
 8406  030040  001004                                                         BNE     $51152
 8407  030042  005704                                                         TST     R4
 8408  030044  001002                                                         BNE     $51152
 8409  030046  005705                                                         TST     R5
 8410  030050  001402                                                         BEQ     $51153
 8411  030052                                                          $51152:
 8412  030052                             CALL ERROR                         JSR     PC,ERROR
 8413  030052  004737  056274
 8414  030056                           ENDIF
 8415  030056                                                          $51153:
 8416  030056                           IFB DS.DST NE #124 THEN
 8417  030056  123727  062474  000124                                         CMPB    DS.DST,#124
 8418  030064  001402                                                         BEQ     $51154
 8419  030066                             CALL ERROP                         JSR     PC,ERROR
 8420  030066  004737  056274
 8421  030072                           ENDIF
```

```
 8422  030072                                                                          $51154:
 8423  030072                        IFB DS.DST+1 NE #62 THEN
 8424  030072  123727  062475  000062                                                        CMPB    DS.DST+1,#62
 8425  030100  001402                                                                      BEQ     $51155
 8426  030102                          CALL ERROR
 8427  030102  004737  056274                                                              JSR     PC,ERROR
 8428  030106                        ENDIF
 8429  030106                                                                          $51155:
 8430  030106                        IFB DS.DST+2 NE #37 THEN
 8431  030106  123727  062476  000037                                                        CMPB    DS.DST+2,#37
 8432  030114  001402                                                                      BEQ     $51156
 8433  030116                          CALL ERROR
 8434  030116  004737  056274                                                              JSR     PC,ERROR
 8435  030122                        ENDIF
 8436  030122                                                                          $51156:
 8437  030122                        INLINE  <JMP  CIS5END>
 8438  030122  000137  031700                                                              JMP  CIS5END
 8439
 8440
 8441
 8442                                ;+
 8443                                ; TABLE OF TEST CASES FOR CVTNP
 8444                                ;-
 8445
 8446  030126  000010                TCVTNP: .WORD   8.              ;# OF TEST CASES FOR CVTNP
 8447
 8448  030130  000000                        .WORD   0                       ;SRC DATA TYPE AND LENGTH
 8449  030132  030216                        .WORD   CVTNP1                  ;POINTER TO INTERMEDIATE SRC STRING
 8450  030134  060000                        .WORD   60000                   ;DST DATA TYPE AND LENGTH
 8451
 8452  030136  050000                        .WORD   50000           ;TEST CASE NUMBER 2
 8453  030140  030222                        .WORD   CVTNP2
 8454  030142  060000                        .WORD   60000
 8455
 8456  030144  030000                        .WORD   30000           ;TEST CASE NUMBER 3
 8457  030146  030226                        .WORD   CVTNP3
 8458  030150  060037                        .WORD   60037
 8459
 8460  030152  020023                        .WORD   20023           ;TEST CASE NUMBER 4
 8461  030154  030232                        .WORD   CVTNP4
 8462  030156  060000                        .WORD   60000
 8463
 8464  030160  040010                        .WORD   40010           ;TEST CASE NUMBER 5
 8465  030162  030260                        .WORD   CVTNP5
 8466  030164  060020                        .WORD   60020
 8467
 8468  030166  010011                        .WORD   10011           ;TEST CASE NUMBER 6
 8469  030170  030272                        .WORD   CVTNP6
 8470  030172  060006                        .WORD   60006
 8471
 8472  030174  000017                        .WORD   17              ;TEST CASE NUMBER 7
 8473  030176  030306                        .WORD   CVTNP7
 8474  030200  060017                        .WORD   60017
 8475
 8476  030202  000006                        .WORD   6               ;TEST CASE NUMBER 8
 8477  030204  030330                        .WORD   CVTNP8
```

```
 8478  030206  070006                          .WORD   70006
 8479
 8480  030210  050000                          .WORD   50000           ;TEST CASE NUMBER 9
 8481  030212  030340                          .WORD   CVTNP9
 8482  030214  060002                          .WORD   60002
 8483
 8484
 8485  030216  000000                  CVTNP1: .WORD   0                       ;SIGN WORD: 0 = +, -1 = -
 8486  030220     000                          .BYTE                           ;MAGNITUDE, ONE BCD PER BYTE
 8487          030222                          .EVEN
 8488
 8489  030222  177777                  CVTNP2: .WORD   -1              ;INTERMEDIATE SRC STRING 2
 8490  030224     000                          .BYTE
 8491          030226                          .EVEN
 8492
 8493  030226  177777                  CVTNP3: .WORD   -1              ;INTERMEDIATE SRC STRING 3
 8494  030230     000                          .BYTF
 8495          030232                          .EVEN
 8496
 8497  030232  177777                  CVTNP4: .WORD   -1              ;INTERMEDIATE SRC STRING 4
 8498  030234     011     010     007          .BYTE   011,010,007,006,005,004,003,002,001,000,001,002,003,004,005,006
 8499  030237     006     005     004
 8500  030242     003     002     001
 8501  030245     000     001     002
 8502  030250     003     004     005
 8503  030253     006
 8504  030254     007     010     011          .BYTE   007,010,011
 8505          030260                          .EVEN
 8506
 8507  030260  000000                  CVTNP5: .WORD   0               ;INTERMEDIATE SRC STRING 5
 8508  030262     007     000     006          .BYTE   007,000,006,001,005,002,004,003
 8509  030265     001     005     002
 8510  030270     004     003
 8511                                  .EVEN
 8512
 8513  030272  177777                  CVTNP6: .WORD   -1              ;INTERMEDIATE SRC STRING 6
 8514  030274     001     003     005          .BYTE   001,003,005,007,011,002,004,006,010
 8515  030277     007     011     002
 8516  030302     004     006     010
 8517          030306                          .EVEN
 8518
 8519  030306  177777                  CVTNP7: .WORD   -1              ;INTERMEDIATE SRC STRING 7
 8520  030310     005     005     007          .BYTE   005,005,007,003,010,002,001,011,004,007,006,000,000,007,001
 8521  030313     003     010     002
 8522  030316     001     011     004
 8523  030321     007     006     000
 8524  030324     000     007     001
 8525          030330                          .EVEN
 8526
 8527  030330  177777                  CVTNP8: .WORD   -1              ;INTERME  ATE SRC STRING 8
 8528  030332     007     005     003          .BYTE   007,005,003,001,004,002
 8529  030335     001     004     002
 8530                                  .EVEN
 8531
 8532  030340  000000                  CVTNP9: .WORD   0               ;INTERMEDIATE SRC STRING 9
 8533  030342     007     002                  .BYTE   007,002
```

```
 8534                                           .EVEN
 8535
 8536
 8537
 8538  030344                                   TCVNPI:                                 ;INLINE TEST CASE
 8539  030344  000005                                   .WORD   000005                          ;SIGNED ZONED, LENGTH = 5
 8540  030346  030354                                   .WORD   NP1                             ;POINTER TO SRC
 8541  030350  070005                                   .WORD   070005                          ;UNSIGNED PACKED, LENGTH = 5
 8542  030352  062474                                   .WORD   DS.DST                          ;POINTER TO DST
 8543
 8544  030354     005      004      003  NP1:      .BYTE   5,4,3,2,161                     ;-54321
 8545  030357     002      161
 8546          030362                               .EVEN
```

```
                        ;;*****************************************************************
                        .SBTTL  CONVERT LONG INTEGER TO INTERMEDIATE FORM ROUTINE
                        ;;*****************************************************************
                        ;* THIS ROUTINE CONVERTS A LONG INTEGER INTO
                        ;* AN INTERMEDIATE FORM.
                        ;* THE INPUT IS THE 31 BIT LONG INTEGER (PLUS THE
                        ;* SIGN BIT) IN REGISTERS R2 AND R3:
                        ;*
                        ;*
                        ;*          R2   !-SIGN-!-----------------HIGH-----------------!
                        ;*               ---------------------------------------------
                        ;*
                        ;*
                        ;*          R3   !-----------------------LOW-------------------!
                        ;*               ---------------------------------------------
                        ;*
                        ;*
                        ;* THE OUTPUT IS:
                        ;* SIGN0 SET TO SIGN OF THE LONG INTEGER
                        ;* (0 FOR +, 177777 FOR -); AND 10 BINARY
                        ;* CODED DECIMAL (BCD) DIGITS PUT INTO MEMORY,
                        ;* ONE DIGIT PER BYTE, STARTING AT DSBUF1,
                        ;* MOST SIGNIFICANT DIGIT FIRST.  DSLEN1 WILL
                        ;* HAVE THE LENGTH (EXCLUDING LEADING ZEROES).
                        ;* THE GENERAL PURPOSE REGISTERS ARE SAVED
                        ;* AT THE BEGINNING OF THE ROUTINE AND RESTORED
                        ;* AT THE END.
                        ;* DSBUF1 DECIMAL STRING BUFFER SHOULD BE CLEAR BEFORE
                        ;* ENTERING THIS ROUTINE.

030362                  ROUTINE CVTLI
030362                                                          CVTLI:

                        ;+
                        ; ROUTINE INITIALIZATION
                        ;-

030362                  CALL SAVREG                     ;SAVE THE GPR'S
030362  004737  055562                                          JSR     PC,SAVREG
030366                  LET SIGN0 := #0
030366  005037  000446                                          CLR     SIGN0
030372                  LET DSLEN1 := #0
030372  005037  000512                                          CLR     DSLEN1

                        ;+
                        ; TEST FOR SPECIAL CASES OF 0 VALUE OR MOST NEGATIVE VALUE
                        ;-

030376                  INLINE <TST   R2>
030376  005702                                                  TST   R2
030400                  IFCOND MI THEN
030400  100003                                                  BPL     $51161
030402                      LET SIGN0 := #-1
030402  012737  177777  000446                                 MOV     #-1,SIGN0
030410                  ENDIF
030410                                                  $51161:
```

CONVERT LONG INTEGER TO INTERMEDIATE FORM ROUTINE SEQ 0184

```
                                        LET TEMP0 := R2 CLR.BY #100000
030410  010237  000474                                                    MOV     R2,TEMP0
030414  042737  100000  000474                                            BIC     #100000,TEMP0
                                        IF R3 EQ #0 AND TEMP0 EQ #0 THEN
030422  005703                                                            TST     R3
030424  001044                                                            BNE     $51162
030426  005737  000474                                                    TST     TEMP0
030432  001041                                                            BNE     $51162
                                            IF SIGN0 EQ #0 THEN
030434  005737  000446                                                    TST     SIGN0
030440  001003                                                            BNE     $51163
                                                ;RETURN
                                                INLINE   <JMP  XCVTLI>
030442
030442  000137  031264                                                    JMP  XCVTLI
                                            ELSE                        ;RESULT = -2,147,483,648
030446  000433                                                            BR      $51164
                                                                        $51163:
030450
030450  012700  062370                                                    MOV     #DSBUF1,R0
                                                LET R0 := #DSBUF1
030454
030454  112720  000002                                                    MOVB    #2,(R0)+
                                                LET (R0)+ :B= #2
030460
030460  112720  000001                                                    MOVB    #1,(R0)+
                                                LET (R0)+ :B= #1
030464
030464  112720  000004                                                    MOVB    #4,(R0)+
                                                LET (R0)+ :B= #4
030470
030470  112720  000007                                                    MOVB    #7,(R0)+
                                                LET (R0)+ :B= #7
030474
030474  112720  000004                                                    MOVB    #4,(R0)+
                                                LET (R0)+ :B= #4
030500
030500  112720  000010                                                    MOVB    #8.,(R0)+
                                                LET (R0)+ :B= #8.
030504
030504  112720  000003                                                    MOVB    #3,(R0)+
                                                LET (R0)+ :B= #3
030510
030510  112720  000006                                                    MOVB    #6,(R0)+
                                                LET (R0)+ :B= #6
030514
030514  112720  000004                                                    MOVB    #4,(R0)+
                                                LET (R0)+ :B= #4
030520
030520  112720  000010                                                    MOVB    #8.,(R0)+
                                                LET (R0)+ :B= #8.
030524
030524  012737  000012  000512                                            MOV     #10.,DSLEN1
                                                LET DSLEN1 := #10.
                                                ;RETURN
                                                INLINE   <JMP  XCVTLI>
030532
030532  000137  031264                                                    JMP  XCVTLI
030536                                      ENDIF
030536                                  ENDIF                           $51164:
030536                                                                  $51162:

                                        ;+
                                        ; LONG INTEGER SOURCE WAS NOT ZERO OR MOST NEGATIVE NUMBER,
                                        ; SO PREPARE FOR CONVERSION ALGORITHM.
                                        ;-

030536                                  IF SIGN0 EQ #-1 THEN
030536  023727  000446  177777                                            CMP     SIGN0,#-1
```

```
8659  030544  001005                        LET R3 := NEGATE R3                                  BNE     $51165
8660  030546                                                                                     NEG     R3
8661  030546  005403                        LET R2 := COMP R2                                    COM     R2
8662  030550                                                                                     TST     R3
8663  030550  005102                        IF R3 EQ #0 THEN                                     BNE     $51166
8664  030552                                                                                     INC     R2
8665  030552  005703                            LET R2 := R2 + #1                        $51166:
8666  030554  001001                        ENDIF                                        $51165:
8667  030556                                ENDIF                                                MOV     #DSBUF1,R0
8668  030556  005202                        LET R0 := #DSBUF1
8669  030560
8670  030560                                ;+
8671  030560                                ; GET TENTH BCD DIGIT (MOST SIGNIFICANT DIGIT)
8672  030560                                ;-
8673  030560
8674  030560  012700  062370                WHILE R2 HI #35632 DO                        $51167:
8675                                                                                             CMP     R2,#35632
8676                                            LET R3 := R3 - #145000                           BLOS    $51170
8677                                            INLINE <SBC R2>                                  SUB     #145000,R3
8678                                            LET R2 := R2 - #35632                            SBC R2
8679                                            LET (R0) :B= (R0) + #1                           SUB     #35632,R2
8680  030564                                ENDDO                                                INCB    (R0)
8681  030564                                                                                     BR      $51167
8682  030564  020227  035632                IF R2 EQ #35632 AND R3 HIS #145000 THEN      $51170:
8683  030570  101407                                                                             CMP     R2,#35632
8684  030572                                                                                     BNE     $51171
8685  030572  162703  145000                    LET R3 := R3 - #145000                          CMP     R3,#145000
8686  030576                                    LET R2 := #0                                    BLO     $51171
8687  030576  005602                            LET (R0) :B= (R0) + #1                          SUB     #145000,R3
8688  030600                                ENDIF                                                CLR     R2
8689  030600  162702  035632                                                                    INCB    (R0)
8690  030604                                ;+                                           $51171:
8691  030604  105210                        ; GET NINTH BCD DIGIT
8692  030606                                ;-
8693  030606  000766                        LET R0 := R0 + #1                                    INC     R0
8694  030610
8695  030610
8696  030610  020227  035632
8697  030614  001007
8698  030616  020327  145000
8699  030622  103404
8700  030624
8701  030624  162703  145000
8702  030630
8703  030630  005002
8704  030632
8705  030632  105210
8706  030634
8707  030634
8708
8709
8710
8711
8712
8713  030634
8714  030634  005200
```

```
 8715  030636                        WHILE R2 HI #2765 DO
 8716  030636                                                          $51172:
 8717  030636  020227  002765                                                 CMP     R2,#2765
 8718  030642  101407                                                       BLOS    $51173
 8719  030644
 8720  030644  162703  160400            LET R3 := R3 - #160400              SUB     #160400,R3
 8721  030650
 8722  030650  005602                    INLINE <SBC R2>                     SBC R2
 8723  030652
 8724  030652  162702  002765            LET R2 := R2 - #2765                SUB     #2765,R2
 8725  030656
 8726  030656  105210                    LET (R0) :B= (R0) + #1              INCB    (R0)
 8727  030660
 8728  030660  000766                ENDDO                                   BR      $51172
 8729  030662                                                          $51173:
 8730  030662                        IF R2 EQ #2765 AND R3 HIS #160400 THEN
 8731  030662  020227  002765                                                 CMP     R2,#2765
 8732  030666  001007                                                       BNE     $51174
 8733  030670  020327  160400                                                 CMP     R3,#160400
 8734  030674  103404                                                       BLO     $51174
 8735  030676
 8736  030676  162703  160400            LET R3 .= R3 - #160400              SUB     #160400,R3
 8737  030702
 8738  030702  005002                    LET R2 := #0                        CLR     R2
 8739  030704
 8740  030704  105210                    LET (R0) :B= (R0) + #1              INCB    (R0)
 8741  030706                        ENDIF
 8742  030706                                                          $51174:
 8743
 8744                                  ;+
 8745                                  ;    GET EIGHTH BCD DIGIT
 8746                                  ;-
 8747
 8748  030706                        LET R0 := R0 + #1                           INC     R0
 8749  030706  005200
 8750  030710                        WHILE R2 HI #230 DO
 8751  030710                                                          $51175:
 8752  030710  020227  000230                                                 CMP     R2,#230
 8753  030714  101407                                                       BLOS    $51176
 8754  030716
 8755  030716  162703  113200            LET R3 := R3 - #113200              SUB     #113200,R3
 8756  030722
 8757  030722  005602                    INLINE <SBC R2>                     SBC R2
 8758  030724
 8759  030724  162702  000230            LET R2 := R2 - #230                 SUB     #230,R2
 8760  030730
 8 01  030730  105210                    LET (R0) :B= (R0) + #1              INCB    (R0)
 8762  030732
 8763  030732  000766                ENDDO                                   BR      $51175
 8764  030734                                                          $51176:
 8765  030734                        IF R2 EQ #230 AND R3 HIS #113200 THEN
 8766  030734  020227  000230                                                 CMP     R2,#230
 8767  030740  001007                                                       BNE     $51177
 8768  030742  020327  113200                                                 CMP     R3,#113200
 8769  030746  103404                                                       BLO     $51177
 8770  030750
```

CONVERT LONG INTEGER TO INTERMEDIATE FORM ROUTINE SEQ 0187

```
 8771  030750  162703  113200                                                    SUB     #113200,R3
 8772  030754
 8773  030754  005002                                                            CLR     R2
 8774  030756
 8775  030756  105210                                                            INCB    (R0)
 8776  030760                        ENDIF
 8777  030760                                                            $51177:
 8778
 8779                                ;+
 8780                                ;   GET SEVENTH BCD DIGIT
 8781                                ;-
 8782
 8783  030760                        LET R0 := R0 + #1
 8784  030760  005200                                                            INC     R0
 8785  030762                        WHILE R2 HI #17 DO
 8786  030762                                                            $51200:
 8787  030762  020227  000017                                                    CMP     R2,#17
 8788  030766  101407                                                            BLOS    $51201
 8789  030770
 8790  030770  162703  041100            LET R3 := R3 - #41100                 SUB     #41100,R3
 8791  030774
 8792  030774  005602                    INLINE <SBC R2>                       SBC R2
 8793  030776
 8794  030776  162702  000017            LET R2 := R2 - #17                    SUB     #17,R2
 8795  031002
 8796  031002  105210                    LET (R0) :B= (R0) + #1                INCB    (R0)
 8797  031004                        ENDDO
 8798  031004  000766                                                            BR      $51200
 8799  031006                                                            $51201:
 8800  031006
 8801  031006  020227  000017        IF R2 EQ #17 AND R3 HIS #41100 THEN       CMP     R2,#17
 8802  031012  001007                                                            BNE     $51202
 8803  031014  020327  041100                                                    CMP     R3,#41100
 8804  031020  103404                                                            BLO     $51202
 8805  031022
 8806  031022  162703  041100            LET R3 := R3 - #41100                 SUB     #41100,R3
 8807  031026
 8808  031026  005002                    LET R2 := #0                          CLR     R2
 8809  031030
 8810  031030  105210                    LET (R0) :B= (R0) + #1                INCB    (R0)
 8811  031032                        ENDIF
 8812  031032                                                            $51202:
 8813
 8814                                ;+
 8815                                ;    GET SIXTH BCD DIGIT
 8816                                ;-
 8817
 8818  031032                        LET R0 := R0 + #1
 8819  031032  005200                                                            INC     R0
 8820  031034                        WHILE R2 HI #1 DO
 8821  031034                                                            $51203:
 8822  031034  020227  000001                                                    CMP     R2,#1
 8823  031040  101406                                                            BLOS    $51204
 8824  031042
 8825  031042  162703  103240            LET R3 := R3 - #103240                SUB     #103240,R3
 8826  031046                            INLINE <SBC R2>
```

```
8827  031046  005602                                                                    SBC R2
8828  031050
8829  031050  005302                                                                    DEC     R2
8830  031052
8831  031052  105210                                                                    INCB    (R0)
8832  031054
8833  031054  000767                                                                    BR      $51203
8834  031056                                                                    $51204:
8835  031056
8836  031056  020227  000001                                                            CMP     R2,#1
8837  031062  001007                                                                    BNE     $51205
8838  031064  020327  103240                                                            CMP     R3,#103240
8839  031070  103404                                                                    BLO     $51205
8840  031072
8841  031072  162703  103240                                                            SUB     #103240,R3
8842  031076
8843  031076  005002                                                                    CLR     R2
8844  031100
8845  031100  105210                                                                    INCB    (R0)
8846  031102
8847  031102                                                                    $51205:
8848
8849
8850
8851
8852
8853  031102                                                                    LET R0 := R0 + #1
8854  031102  005200                                                                    INC     R0
8855  031104                                                                    WHILE R2 EQ #1 DO
8856  031104                                                                    $51206:
8857  031104  020227  000001                                                            CMP     R2,#1
8858  031110  001005                                                                    BNE     $51207
8859  031112
8860  031112  162703  023420                                                            SUB     #23420,R3
8861  031116
8862  031116  005602                                                                    SBC R2
8863  031120
8864  031120  105210                                                                    INCB    (R0)
8865  031122
8866  031122  000770                                                                    BR      $51206
8867  031124                                                                    $51207:
8868  031124                                                                    $51210:
8869  031124
8870  031124  020327  023420                                                            CMP     R3,#23420
8871  031130  103404                                                                    BLO     $51211
8872  031132
8873  031132  162703  023420                                                            SUB     #23420,R3
8874  031136
8875  031136  105210                                                                    INCB    (R0)
8876  031140
8877  031140  000771                                                                    BR      $51210
8878  031142                                                                    $51211:
8879
8880
8881
8882
```

```
                        LET R2 := R2 - #1
                        LET (R0) :B= (R0) + #1
                    ENDDO

                    IF R2 EQ #1 AND R3 HIS #103240 THEN

                        LET R3 := R3 - #103240
                        LET R2 := #0
                        LET (R0) :B= (R0) + #1
                    ENDIF

                    ;+
                    ;   GET FIFTH BCD DIGIT
                    ;-

                    LET R0 := R0 + #1
                    WHILE R2 EQ #1 DO

                        LET R3 := R3 - #23420
                        INLINE <SBC R2>
                        LET (R0) :B= (R0) + #1
                    ENDDO

                    WHILE R3 HIS #23420 DO

                        LET R3 := R3 - #23420
                        LET (R0) :B= (R0) + #1
                    ENDDO

                    ;+
                    ;   GET FOURTH BCD DIGIT
                    ;-
```

```
 8883
 8884  031142                          LET R0 := R0 + #1
 8885  031142  005200                                                  INC     R0
 8886  031144                          WHILE R3 HIS #1750 DO
 8887  031144                                                  $51212:
 8888  031144  020327  001750                                         CMP     R3,#1750
 8889  031150  103404                                                 BLO     $51213
 8890  031152                              LET R3 := R3 - #1750        SUB     #1750,R3
 8891  031152  162703  001750
 8892  031156                              LET (R0) :B= (R0) + #1      INCB    (R0)
 8893  031156  105210
 8894  031160                          ENDDO                           BR      $51212
 8895  031160  000771                                                 BR
 8896  031162                                                  $51213:
 8897
 8898                                  ;+
 8899                                  ;   GET THIRD BCD DIGIT
 8900                                  ;-
 8901
 8902  031162                          LET R0 := R0 + #1
 8903  031162  005200                                                  INC     R0
 8904  031164                          WHILE R3 HIS #144 DO
 8905  031164                                                  $51214:
 8906  031164  020327  000144                                         CMP     R3,#144
 8907  031170  103404                                                 BLO     $51215
 8908  031172                              LET R3 := R3 - #144         SUB     #144,R3
 8909  031172  162703  000144
 8910  031176                              LET (R0) :B= (R0) + #1      INCB    (R0)
 8911  031176  105210
 8912  031200                          ENDDO                           BR      $51214
 8913  031200  000771                                                 BR
 8914  031202                                                  $51215:
 8915
 8916                                  ;+
 8917                                  ;    GET SECOND AND FIRST BCD DIGITS
 8918                                  ;-
 8919
 8920  031202                          LET R0 := R0 + #1
 8921  031202  005200                                                  INC     R0
 8922  031204                          WHILE R3 HIS #12 DO
 8923  031204                                                  $51216:
 8924  031204  020327  000012                                         CMP     R3,#12
 8925  031210  103404                                                 BLO     $51217
 8926  031212                              LET R3 := R3 - #12          SUB     #12,R3
 8927  031212  162703  000012
 8928  031216                              LET (R0) :B= (R0) + #1      INCB    (R0)
 8929  031216  105210
 8930  031220                          ENDDO                           BR      $51216
 8931  031220  000771                                                 BR
 8932  031222                                                  $51217:
 8933  031222
 8934  031222  005200                  LET R0 := R0 + #1               INC     R0
 8935  031224                          LET (R0) :B= R3
 8936  031224  110310                                                  MOVB    R3,(R0)
 8937
 8938                                  ;+
```

CONVERT LONG INTEGER TO INTERMEDIATE FORM ROUTINE SEQ 0190

```
                        ; DETERMINE THE NUMBER OF SIGNIFICANT DIGITS.
                        ;-

031226                  LET R0 := #DSBUF1
031226  012700  062370                                          MOV     #DSBUF1,R0
031232                  WHILEB (R0) EQ #0 DO
031232                                                  $51220:
031232  105710                                                  TSTB    (R0)
031234  001002                                                  BNE     $51221
031236                      LET R0 :- R0 + #1
031236  005200                                                  INC     R0
031240                  ENDDO
031240  000774                                                  BR      $51220
031242                                                  $51221:
031242                  LET R0 := R0 - #DSBUF1          ;# OF LEADING 0'S
031242  162700  062370                                          SUB     #DSBUF1,R0
031246                  LET DSLEN1 := #10. - R0         ;# OF MOST SIGNIFICANT DIGITS
031246  012737  000012  0005'2                                  MOV     #10.,DSLEN1
031254  160037  000512                                          SUB     R0,DSLEN1
031260                  CALL RESREG                     ;RESTORE THE GPR'S
031260  004737  055614                                          JSR     PC,RESREG
031264                  INLINE   <XCVTLI:>
031264                                                  XCVTLI:
031264                  ENDRTN
031264                                                  $51157:
031264                                                  $51160:
031264  000207                                                  RTS     PC

                        ;;*****************************************************************
                        .SBTTL  CONVERT INTERMEDIATE FORM TO LONG INTEGER ROUTINE
                        ;;*****************************************************************
                        ;* THIS ROUTINE CONVERTS A 10 BCD DIGIT INTERMEDIATE FORM INTO
                        ;* LONG INTEGER FORMAT.  THE INPUT IS 10 BCD DIGITS IN THE 10 BYTES STARTING
                        ;* AT DSBUF1, MOST SIGNIFICANT DIGIT FIRST; AND SIGN0.
                        ;* THE OUTPUT IS A TWO'S COMPLEMENT 31 BIT BINARY LONG INTEGER IN LOCATIONS
                        ;* R2.EXP AND R3.EXP.
                        ;* THIS ROUTINE ASSUMES THAT THE 10 BCD DIGIT NUMBER IS SMALL ENOUGH
                        ;* TO BE REPRESENTED AS A 31 BIT BINARY INTEGER.

031266                  ROUTINE CVTIL
031266                                                  CVTIL:

                        ;+
                        ; ROUTINE INITIALIZATION
                        ;-

031266                  CALL SAVREG                     ;SAVE THE GPR'S
031266  004737  055562                                          JSR     PC,SAVREG
031272                  LET R2.EXP := #0
031272  005037  000526                                          CLR     R2.EXP
031276                  LET R3.EXP := #0
031276  005037  000530                                          CLR     R3.EXP
031302                  LET R0 := #DSBUF1
031302  012700  062370                                          MOV     #DSBUF1,R0
```

```
 8995                                   ;+
 8996                                   ;+
 8997                                   ; ADD IN BINARY EQUIVALENT OF TENTH BCD DIGIT
 8998                                   ;-
 8999
 9000  031306                           WHILEB (R0) GT #0 DO                                  $51224:
 9001  031306                                                                                         TSTB    (R0)
 9002  031306  105710                                                                                BLE     $51225
 9003  031310  003412
 9004  031312                               LET R3.EXP := R3.EXP + #145000                            ADD     #145000,R3.EXP
 9005  031312  062737  145000  000530
 9006  031320                               INLINE   <ADC  R2.EXP>                                    ADC  R2.EXP
 9007  031320  005537  000526
 9008  031324                               LET R2.EXP := R2.EXP + #35632                             ADD     #35632,R2.EXP
 9009  031324  062737  035632  000526
 9010  031332                               LET (R0) :B= (R0) - #1                                    DECB    (R0)
 9011  031332  105310
 9012  031334                           ENDDO                                                         BR      $51224
 9013  031334  000764                                                                        $51225:
 9014  031336
 9015
 9016                                   ;+
 9017                                   ; ADD IN BINARY EQUIVALENT OF NINTH BCD DIGIT
 9018                                   ;-
 9019
 9020  031336                           LET R0 := R0 + #1                                             INC     R0
 9021  031336  005200
 9022  031340                           WHILEB (R0) GT #0 DO                                  $51226:
 9023  031340                                                                                         TSTB    (R0)
 9024  031340  105710                                                                                BLE     $51227
 9025  031342  003412
 9026  031344                               LET R3.EXP := R3.EXP + #160400                            ADD     #160400,R3.EXP
 9027  03 344  062737  160400  000530
 9028  031352                               INLINE   <ADC  R2.EXP>                                    ADC  R2.EXP
 9029  031352  005537  000526
 9030  031356                               LET R2.EXP := R2.EXP + #2765                              ADD     #2765,R2.EXP
 9031  031356  062737  002765  000526
 9032  031364                               LET (R0) :B= (R0) - #1                                    DECB    (R0)
 9033  031364  105310
 9034  031366                           ENDDO                                                         BR      $51226
 9035  031366  000764                                                                        $51227:
 9036  031370
 9037
 9038                                   ;+
 9039                                   ; ADD IN BINARY EQUIVALENT OF EIGHTH BCD DIGIT
 9040                                   ;-
 9041
 9042  031370                           LET R0 := R0 + #1                                             INC     R0
 9043  031370  005200
 9044  031372                           WHILEB (R0) GT #0 DO                                  $51230:
 9045  031372                                                                                         TSTB    (R0)
 9046  031372  105710                                                                                BLE     $51231
 9047  031374  003412
 9048  031376                               LET R3.EXP := R3.EXP + #113200                            ADD     #113200,R3.EXP
 9049  031376  062737  113200  000530
 9050  031404                               INLINE   <ADC  R2.EXP>
```

```
 9051  031404  005537  000526                                                    ADC  R2.EXP
 9052  031410                          LET R2.EXP := R2.EXP + #230
 9053  031410  062737  000230  000526                                            ADD     #230,R2.EXP
 9054  031416                          LET (R0) :B= (R0) - #1
 9055  031416  105310                                                           DECB    (R0)
 9056  031420                      ENDDO
 9057  031420  000764                                                           BR      $51230
 9058  031422                                                          $51231:
 9059
 9060                              ;+
 9061                              ; ADD IN BINARY EQUIVALENT OF SEVENTH BCD DIGIT
 9062                              ;-
 9063
 9064  031422                      LET R0 := R0 + #1
 9065  031422  005200                                                           INC     R0
 9066  031424                      WHILEB (R0) GT #0 DO
 9067  031424                                                          $51232:
 9068  031424  105710                                                           TSTB    (R0)
 9069  031426  003412                                                           BLE     $51233
 9070  031430                          LET R3.EXP := R3.EXP + #41100
 9071  031430  062737  041100  000530                                            ADD     #41100,R3.EXP
 9072  031436                          INLINE   <ADC  R2.EXP>
 9073  031436  005537  000526                                                   ADC  R2.EXP
 9074  031442                          LET R2.EXP := R2.EXP + #17
 9075  031442  062737  000017  000526                                            ADD     #17,R2.EXP
 9076  031450                          LET (R0) :B= (R0) - #1
 9077  031450  105310                                                           DECB    (R0)
 9078  031452                      ENDDO
 9079  031452  000764                                                           BR      $51232
 9080  031454                                                          $51233:
 9081
 9082                              ;+
 9083                              ; ADD IN BINARY EQUIVALENT OF SIXTH BCD DIGIT
 9084                              ;-
 9085
 9086  031454                      LET R0 := R0 + #1
 9087  031454  005200                                                           INC     R0
 9088  031456                      WHILEB (R0) GT #0 DO
 9089  031456                                                          $51234:
 9090  031456  105710                                                           TSTB    (R0)
 9091  031460  003411                                                           BLE     $51235
 9092  031462                          LET R3.EXP := R3.EXP + #103240
 9093  031462  062737  103240  000530                                            ADD     #103240,R3.EXP
 9094  031470                          INLINE   <ADC  R2.EXP>
 9095  031470  005537  000526                                                   ADC  R2.EXP
 9096  031474                          LET R2.EXP := R2.EXP + #1
 9097  031474  005237  000526                                                   INC     R2.EXP
 9098  031500                          LET (R0) :B= (R0) - #1
 9099  031500  105310                                                           DECB    (R0)
 9100  031502                      ENDDO
 9101  031502  000765                                                           BR      $51234
 9102  031504                                                          $51235:
 9103
 9104                              ;+
 9105                              ; ADD IN BINARY EQUIVALENT OF FIFTH BCD DIGIT
 9106                              ;-
```

```
                                                                                                    INC     R0
                        LET R0 := R0 + #1                                                   $51236:
                        WHILEB (R0) GT #0 DO                                                        TSTB    (R0)
                                                                                                    BLE     $51237
                            LET R3.EXP := R3.EXP + #23420                                           ADD     #23420,R3.EXP
                            INLINE   <ADC  R2.EXP>                                                  ADC  R2.EXP
                            LET (R0) :B= (R0) - #1                                                  DECB    (R0)
                        ENDDO                                                                       BR      $51236
                                                                                            $51237:

                        ;+
                        ; ADD IN BINARY EQUIVALENT OF FOURTH BCD DIGIT
                        ;-

                        LET R0 := R0 + #1                                                           INC     R0
                        WHILEB (R0) GT #0 DO                                                $51240:
                                                                                                    TSTB    (R0)
                            LET R3.EXP := R3.EXP + #1750                                            BLE     $51241
                            INLINE   <ADC  R2.EXP>                                                  ADD     #1750,R3.EXP
                            LET (R0) :B= (R0) - #1                                                  ADC  R2.EXP
                        ENDDO                                                                       DECB    (R0)
                                                                                                    BR      $51240
                                                                                            $51241:

                        ;+
                        ; ADD IN BINARY EQUIVALENT OF THIRD BCD DIGIT
                        ;-

                        LET R0 := R0 + #1                                                           INC     R0
                        WHILEB (R0) GT #0 DO                                                $51242:
                                                                                                    TSTB    (R0)
                            LET R3.EXP := R3.EXP + #144                                             BLE     $51243
                            INLINE   <ADC  R2.EXP>                                                  ADD     #144,R3.EXP
                            LET (R0) :B= (R0) - #1                                                  ADC  R2.EXP
                        ENDDO                                                                       DECB    (R0)
                                                                                                    BR      $51242
                                                                                            $51243:
```

```
 9163
 9164                                   ;+
 9165                                   ; ADD IN BINARY EQUIVALENT OF SECOND BCD DIGIT
 9166                                   ;-
 9167
 9168  031600                           LET R0 := R0 + #1
 9169  031600  005200                                                          INC     R0
 9170  031602                           WHILEB (R0) GT #0 DO
 9171  031602                                                                $51244:
 9172  031602  105710                                                          TSTB    (R0)
 9173  031604  003407                                                          BLE     $51245
 9174  031606                               LET R3.EXP := R3.EXP + #12
 9175  031606  062737  000012  000530                                         ADD     #12,R3.EXP
 9176  031614                               INLINE   <ADC  R2.EXP>
 9177  031614  005537  000526                                                 ADC  R2.EXP
 9178  031620                               LET (R0) :B= (R0) - #1
 9179  031620  105310                                                          DECB    (R0)
 9180  031622                           ENDDO
 9181  031622  000767                                                          BR      $51244
 9182  031624                                                                $51245:
 9183
 9184                                   ;+
 9185                                   ; ADD IN FIRST DIGIT
 9186                                   ;-
 9187
 9188  031624                           LET R0 .= R0 + #1
 9189  031624  005200                                                          INC     R0
 9190  031626                           INLINE  <SWAB   (R0)>
 9191  031626  000310                                                          SWAB    (R0)
 9192  031630                           LET R3.EXP := R3.EXP + (R0)
 9193  031630  061037  000530                                                 ADD     (R0),R3.EXP
 9194  031634                           INLINE   <ADC  R2.EXP>
 9195  031634  005537  000526                                                 ADC  R2.EXP
 9196  031640                           IF SIGN0 EQ #-1 THEN
 9197  031640  023727  000446  177777                                         CMP     SIGN0,#-1
 9198  031646  001011                                                          BNE     $51246
 9199  031650                               LET R3.EXP := NEGATE R3.EXP
 9200  031650  005437  000530                                                 NEG     R3.EXP
 9201  031654                               LET R2.EXP := COMP R2.EXP
 9202  031654  005137  000526                                                 COM     R2.EXP
 9203  031660                               IF R3.EXP EQ #0 THEN
 9204  031660  005737  000530                                                 TST     R3.EXP
 9205  031664  001002                                                          BNE     $51247
 9206  031666                                   LET R2.EXP := R2.EXP + #1
 9207  031666  005237  000526                                                 INC     R2.EXP
 9208  031672                               ENDIF
 9209  031672                                                                $51247:
 9210  031672                           ENDIF
 9211  031672                                                                $51246:
 9212  031672                           CALL RESREG                 ;RESTORE GPR'S
 9213  031672  004737  055614                                                 JSR     PC,RESREG
 9214  031676                           ENDRTN
 9215  031676                                                                $51222:
 9216  031676                                                                $51223:
 9217  031676  000207                                                          RTS     PC
 9218
```

```
 9219  031700                          INLINE   <CISSEND:>
 9220  031700
 9221                                                                  CISSEND:
 9222
```

```
                                ;*****************************************************************
                                ;*****************************************************************
                                ;++
                                ;               C I S 6     M O D U L E
                                ;
                                ;  THIS MODULE TESTS THE NUMERIC DATA TYPE ARITHMETIC
                                ;  INSTRUCTIONS: ADDN, SUBN, CMPN, AND ASHN.
                                ;--
                                ;*****************************************************************
                                ;*****************************************************************




                                .SBTTL  CIS6 INITIALIZATION
                                ;*****************************************************************
                                ;
                                ;  CIS6 INITIALIZATION
                                ;
                                ;*****************************************************************

                                ;IF SWR<5:0> ARE CLEARED OR IF SWR<2> IS SET THEN EXECUTE
                                ;  THE CIS6 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

031700                          INLINE   <SCOPE>
031700  000004                                                          SCOPE

031702                          LET TEMP0 := @SWR CLR.BY #177700
031702  017737  146520  000474                                        MOV     @SWR,TEMP0
031710  042737  177700  000474                                        BIC     #177700,TEMP0

031716                          IF TEMP0 NE #0 THEN
031716  005737  000474                                                TST     TEMP0
031722  001406                                                        BEQ     $51250

031724                            IF #BIT2 NOTSETIN TEMP0 THEN
031724  032737  000004  000474                                        BIT     #BIT2,TEMP0
031732  001002                                                        BNE     $51251

031734                              INLINE   <JMP   CIS6END>
031734  000137  044432                                                JMP     CIS6END

031740                            ENDIF                                       $51251:
031740                          ENDIF                                         $51250:
031740
031740                          LET CTL := #6           ;CONTROL CHIP NUMBER
031740  012737  000006  000544                                        MOV     #6,CTL
031746                          LET ERRFLG :- #0        ;INITIALIZE ERROR FLAG
031746  005037  000454                                                CLR     ERRFLG
031752                          LET PSW :- #340
031752  012737  000340  177776                                        MOV     #340,PSW
031760                          LET ERR :  #1
031760  012737  000001  000550                                        MOV     #1,ERR
```

```
                                        .SBTTL  ADDN
                                        ;*****************************************************************
                                        ;
                                        ;       ADDN TEST
                                        ;
                                        ;*****************************************************************

                                        INLINE <XADDN:>                                                 XADDN:
                                        INLINE <SCOPE>                                                  SCOPE
                                        LET $TIMES := #10               ;ITERATION COUNT                MOV     #10,$TIMES
                                        LET COUNT := TADD               ;# OF TEST CASES                MOV     TADD,COUNT
                                        LET TSTCAS := #TADD+2           ;POINT TO FIRST TEST CASE       MOV     #TADD+2,TSTCAS

                                        ;+
                                        ;       CLR R0.EXT TO R3.EXP
                                        ;-

                                        INCR  R0 FROM #0 TO #6 BY #2                                    CLR     R0
                                                                                                        BR      $51252
                                                                                                $51253:
                                                                                                        ADD     #2,R0
                                                                                                $51252:
                                                                                                        CMP     R0,#6
                                                                                                        BGT     $51254
                                         INLINE <CLR R0.EXP(R0)>                                        CLR R0.EXP(R0)
                                        ENDINC                                                          BR      $51253
                                                                                                $51254:

                                        ;REPEAT OUTER LOOP FOR TEST CASES
                                        INLINE <$5050:>                                                 $5050:
                                         CALL CLRDSB                    ;CLR DS BUFFERS                 JSR     PC,CLRDSB

                                         ;+
                                         ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
                                         ;-

                                         LET R0 :- TSTCAS                                               MOV     TSTCAS,R0
                                         LET DATA00 := (R0)+            ;SRC1 LENGTH                    MOV     (R0)+,DATA00
                                         LET DATA01 := (R0)+            ;POINTER TO SRC1 DATA           MOV     (R0)+,DATA01
                                         LET DATA02 := (R0)+            ;SRC2 LENGTH                    MOV     (R0)+,DATA02
                                         LET DATA03 := (R0)+            ;POINTER TO SRC2 DATA           MOV     (R0)+,DATA03
                                         LET DATA04 :  (R0)+            ;DEST LENGTH
```

```
 9330  032066  012037  000570                                                                    MOV     (R0)+,DATA04
 9331  032072
 9332  032072  012037  000572                                                                    MOV     (R0)+,DATA05
 9333  032076
 9334  032076  012037  000520                                                                    MOV     (R0)+,CC.EXP
 9335
 9336
 9337
 9338
 9339
 9340  032102
 9341  032102  005737  000560                                                                    TST     DATA00
 9342  032106  001413                                                                            BEQ     $51255
 9343  032110
 9344  032110  013700  000562                                                                    MOV     DATA01,R0
 9345  032114
 9346  032114  012037  000446                                                                    MOV     (R0)+,SIGN0
 9347  032120
 9348  032120  013701  000560                                                                    MOV     DATA00,R1
 9349  032124
 9350  032124  012702  062370                                                                    MOV     #DSBUF1,R2
 9351  032130
 9352  032130                                                                                    1$:
 9353  032130
 9354  032130  112022                                                                            MOVB (R0)+,(R2)+
 9355  032132
 9356  032132  077102                                                                            SOB R1,1$
 9357  032134
 9358  032134  000402                                                                            BR      $51256
 9359  032136                                                                            $51255:
 9360  032136
 9361  032136  005037  000446                                                                    CLR     SIGN0
 9362  032142
 9363  032142                                                                            $51256:
 9364
 9365
 9366
 9367
 9368
 9369  032142
 9370  032142  005737  000564                                                                    TST     DATA02
 9371  032146  001413                                                                            BEQ     $51257
 9372  032150
 9373  032150  013700  000566                                                                    MOV     DATA03,R0
 9374  032154
 9375  032154  012037  000450                                                                    MOV     (R0)+,SIGN1
 9376  032160
 9377  032160  013701  000564                                                                    MOV     DATA02,R1
 9378  032164
 9379  032164  012702  062432                                                                    MOV     #DSBUF2,R2
 9380  032170
 9381  032170                                                                                    2$:
 9382  032170
 9383  032170  112022                                                                            MOVB (R0)+,(R2)+
 9384  032172
 9385  032172  077102                                                                            SOB R1,2$
```

```
                LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
                LET CC.EXP := (R0)+             ;CC.EXP (SUM)

                ;+
                ;       LOAD DSBUF1
                ;-

                IF DATA00 NE #0 THEN            ;CHECK FOR ZERO LENGTH BUFFER

                 LET R0 := DATA01

                 LET SIGN0 := (R0)+             ;STORE SIGN AND POINT AT FIRST BYTE

                 LET R1 := DATA00               ;# OF BYTES TO TRANSFER

                 LET R2 := #DSBUF1              ;TRANSFER DESTINATION

                 INLINE <1$:>

                 INLINE <MOVB (R0)+,(R2)+>

                 INLINE <SOB R1,1$>

                ELSE

                 LET SIGN0 := #0

                ENDIF

                ;+
                ;       LOAD DSBUF2
                ;-

                IF DATA02 NE #0 THEN

                 LET R0 := DATA03

                 LET SIGN1 := (R0)+

                 LET R1 := DATA02

                 LET R2 := #DSBUF2

                 INLINE <2$:>

                 INLINE <MOVB (R0)+,(R2)+>

                 INLINE <SOB R1,2$>
```

```
9386  032174                          ELSE                                        BR      $51260
9387  032174  000402                                                    $51257:
9388  032176                                                                      CLR     SIGN1
9389  032176                          LET SIGN1 := #0
9390  032176  005037  000450                                            $51260:
9391  032202                          ENDIF
9392  032202
9393
9394                                  ;+
9395                                  ;       LOAD DS.EXP
9396                                  ;-
9397
9398  032202                          IF DATA04 NE #0 THEN                        TST     DATA04
9399  032202  005737  000570                                                     BEQ     $51261
9400  032206  001415
9401  032210                          LET R0 :- DATA05                            MOV     DATA05,R0
9402  032210  013700  000572
9403  032214                          LET SIGN2 := (R0)+                          MOV     (R0)+,SIGN2
9404  032214  012037  000452
9405  032220                          LET R1 := DATA04                            MOV     DATA04,R1
9406  032220  013701  000570
9407  032224                          LET R2 := #DS.EXP                           MOV     #DS.EXP,R2
9408  032224  012702  062536
9409  032230                          INLINE <3$:>                                3$:
9410  032230
9411  032230                          INLINE <MOVB  (R0)+,(R2)>                   MOVB    (R0)+,(R2)
9412  032230  112012
9413  032232                          INLINE <BISB  #60,(R2)+>                    BISB    #60,(R2)+
9414  032232  152722  000060
9415  032236                          INLINE <SOB R1,3$>                          SOB R1,3$
9416  032236  077104
9417  032240                          ELSE                                        BR      $51262
9418  032240  000402
9419  032242                                                              $51261:
9420  032242                          LET SIGN2 := #0                             CLR     SIGN2
9421  032242  005037  000452
9422  032246                          ENDIF                               $51262:
9423  032246
9424
9425                                  ;+
9426                                  ;       LOAD DSTMP'S WITH MDS & LSD OF EACH BUFFER
9427                                  ;-
9428
9429  032246                          LET DSTMP0 :B= DSBUF1                       MOVB    DSBUF1,DSTMP0
9430  032246  113737  062370  000552
9431  032254                          LET TEMP0 :- #DSBUF1-1 + DATA00             MOV     #DSBUF1-1,TEMP0
9432  032254  012737  062367  000474                                             ADD     DATA00,TEMP0
9433  032262  063737  000560  000474
9434  032270                          LET DSTMP1 :B- @TEMP0                       MOVB    @TEMP0,DSTMP1
9435  032270  117737  146200  000553
9436  032276                          LET DSTMP2 :B= DSBUF2                       MOVB    DSBUF2,DSTMP2
9437  032276  113737  062432  000554
9438  032304                          LET TEMP0 :- #DSBUF2-1 + DATA02             MOV     #DSBUF2-1,TEMP0
9439  032304  012737  062431  000474                                             ADD     DATA02,TEMP0
9440  032312  063737  000564  000474
9441  032320                          LET DSTMP3 :B  @TEMP0
```

```
 9442  032320  117737  146150  000555                                                          MOVB    @TEMP0,DSTMP3
 9443  032326
 9444  032326  113737  062536  000556   LET DSTMP4 :B= DS.EXP                                 MOVB    DS.EXP,DSTMP4
 9445  032334
 9446  032334  012737  062535  000474   LET TEMP0 := #DS.EXP-1 + DATA04                       MOV     #DS.EXP-1,TEMP0
 9447  032342  063737  000570  000474                                                         ADD     DATA04,TEMP0
 9448  032350
 9449  032350  117737  146120  000557   LET DSTMP5 :B= @TEMP0                                 MOVB    @TEMP0,DSTMP5
 9450  032356
 9451  032356  012737  062370  000616   LET DESCR1 := #DSBUF1                                 MOV     #DSBUF1,DESCR1
 9452  032364
 9453  032364  012737  062432  000622   LET DESCR3 :- #DSBUF2                                 MOV     #DSBUF2,DESCR3
 9454  032372
 9455  032372  012737  062474  000626   LET DESCR5 := #DS.DST                                 MOV     #DS.DST,DESCR5
 9456
 9457
 9458  032400                           ; INCR TEMP0 FROM #1 TO #5 BY #1        SRC1 DATA TYPE LOOP
 9459  032400  005037  000474           INLINE <CLR @#TEMP0>                                  CLR @#TEMP0
 9460  032404
 9461  032404  005237  000474           INLINE <INC1: INC TEMP0>                              INC1: INC TEMP0
 9462  032410
 9463  032410  023727  000474  000005   IF TEMP0 GT #5 THEN                                   CMP     TEMP0,#5
 9464  032416  003402                                                                         BLE     $51263
 9465  032420
 9466  032420  000137  034246            INLINE <JMP END1>                                    JMP END1
 9467  032424
 9468  032424                           ENDIF                                          $51263:
 9469
 9470                                    ;+
 9471                                    ;    RESTORE MSD & LSD OF DSBUF1
 9472                                    ;-
 9473
 9474  032424                           LET DSBUF1 :B= DSTMP0          ;MSD
 9475  032424  113737  000552  062370                                                          MOVB    DSTMP0,DSBUF1
 9476  032432                           LET TEMP2 := #DSBUF1-1 + DATA00
 9477  032432  012737  062367  000500                                                         MOV     #DSBUF1-1,TEMP2
 9478  032440  063737  000560  000500                                                         ADD     DATA00,TEMP2
 9479  032446
 9480  032446  113777  000553  146024   LET @TEMP2 :B= DSTMP1          ;LSD                   MOVB    DSTMP1,@TEMP2
 9481
 9482                                    ;+
 9483                                    ;    SIGN DSBUF1 BY DATA TYPE
 9484                                    ;-
 9485
 9486  032454                           SELECT TEMP0 OF 5
 9487  032454  013746  000474                                                                 MOV     TEMP0,-(SP)
 9488  032460  006316                                                                         ASL     (SP)
 9489  032462  060716                                                                         ADD     PC,(SP)
 9490  032464  063607                                                                         ADD     @(SP)+,PC
 9491  032466                                                                         $51264:
 9492  032466  000012                                                                         .WORD   $51272-$51264
 9493  032470  000052                                                                         .WORD   $51271-$51264
 9494  032472  000116                                                                         .WORD   $51270-$51264
 9495  032474  000162                                                                         .WORD   $51267-$51264
 9496  032476  000226                                                                         .WORD   $51266-$51264
 9497  032500                           CASE 1
```

```
 9498  032500                                                                                  $51272:
 9499  032500                        LET DESCR0 := DATA00          ;SIGNED ZONED
 9500  032500  013737  000560  000614                                                         MOV     DATA00,DESCR0
 9501  032506                        IF SIGN0 EQ #0 THEN
 9502  032506  005737  000446                                                                 TST     SIGN0
 9503  032512  001004                                                                         BNE     $51273
 9504  032514                         LET @TEMP2 :B= @TEMP2 SET.BY #60     ;+
 9505  032514  152777  000060  145756                                                         BISB    #60,@TEMP2
 9506  032522                        ELSE
 9507  032522  000403                                                                         BR      $51274
 9508  032524                                                                              $51273:
 9509  032524                         LET @TEMP2 :B= @TEMP2 SET.BY #160    ;-
 9510  032524  152777  000160  145746                                                         BISB    #160,@TEMP2
 9511  032532                        ENDIF
 9512  032532                                                                              $51274:
 9513  032532                        LET DSBUF1-1 :B= #0           ;FIX LEADING SEPARATE RESULT
 9514  032532  105037  062367                                                                 CLRB    DSBUF1-1
 9515
 9516  032536                    CASE 2
 9517  032536  000512                                                                         BR      $51265
 9518  032540                                                                              $51271:
 9519  032540                        LET DESCR0 := DATA00 SET.BY #20000    ;TRAILING OVERPUNCH
 9520  032540  013737  000560  000614                                                         MOV     DATA00,DESCR0
 9521  032546  052737  020000  000614                                                         BIS     #20000,DESCR0
 9522  032554                        LET R5 :B= DSTMP1     ;GET LSD
 9523  032554  113705  000553                                                                 MOVB    DSTMP1,R5
 9524  032560                        IF SIGN0 EQ #-1 THEN
 9525  032560  023727  000446  177777                                                         CMP     SIGN0,#-1
 9526  032566  001002                                                                         BNE     $51275
 9527  032570                         LET R5 := R5 + #10.          ;CHANGE INDEX FOR -
 9528  032570  062705  000012                                                                 ADD     #10.,R5
 9529  032574                        ENDIF
 9530  032574                                                                              $51275:
 9531  032574                        LET @TEMP2 :B- OVPNCH(R5)
 9532  032574  116577  055254  145676                                                         MOVB    OVPNCH(R5),@TEMP
 9533
 9534  032602                    CASE 3
 9535  032602  000470                                                                         BR      $51265
 9536  032604                                                                              $51270:
 9537  032604                         LET DESCR0 := DATA00 SET.BY #30000     ;LEADING OVERPUNCH
 9538  032604  013737  000560  000614                                                         MOV     DATA00,DESCR0
 9539  032612  052737  030000  000614                                                         BIS     #30000,DESCR0
 9540  032620                          LET R5 :B= DSTMP0     ;GET MSD
 9541  032620  113705  000552                                                                 MOVB    DSTMP0,R5
 9542  032624                          IF SIGN0 EQ #-1 THEN
 9543  032624  023727  000446  177777                                                         CMP     SIGN0,#-1
 9544  032632  001002                                                                         BNE     $51276
 9545  032634                           LET R5 := R5 + #10.
 9546  032634  062705  000012                                                                 ADD     #10.,R5
 9547  032640                          ENDIF
 9548  032640                                                                              $51276:
 9549  032640                          LET DSBUF1 :B- OVPNCH(R5)
 9550  032640  116537  055254  062370                                                         MOVB    OVPNCH(R5),DSBUF
 9551
 9552
 9553  032646                    CASE 4
```

```
9554  032646  000446                                                                    BR      $51265
9555  032650                                                                  $51267:
9556  032650                    LET DESCR0 := DATA00 SET.BY #40000    ;TRAILING SEPARATE
9557  032650  013737  000560  000614                                          MOV     DATA00,DESCR0
9558  032656  052737  040000  000614                                          BIS     #40000,DESCR0
9559  032664
9560  032664  013705  000500                      LET R5 := TEMP2 + #1        MOV     TEMP2,R5
9561  032670  005205                                                          INC     R5
9562  032672
9563  032672  005737  000446                    IF SIGN0 EQ #0 THEN           TST     SIGN0
9564  032676  001003                                                          BNE     $51277
9565  032700
9566  032700  112715  000053                      LET (R5) :B= #53  ;+ SIGN   MOVB    #53,(R5)
9567  032704
9568  032704  000402                            ELSE                          BR      $51300
9569  032706                                                          $51277:
9570  032706
9571  032706  112715  000055                      LET (R5) :B= #55  ;- SIGN   MOVB    #55,(R5)
9572  032712
9573  032712                                    ENDIF
9574                                                                  $51300:
9575  032712
9576  032712  000424                          CASE 5                          BR      $51265
9577  032714                                                          $51266:
9578  032714                    LET DESCR0 := DATA00 SET.BY #50000    ;LEADING SEPARATE
9579  032714  013737  000560  000614                                          MOV     DATA00,DESCR0
9580  032722  052737  050000  000614                                          BIS     #50000,DESCR0
9581  032730
9582  032730  013705  000500                      LET R5 :- TEMP2 + #1        MOV     TEMP2,R5
9583  032734  005205                                                          INC     R5
9584  032736
9585  032736  105015                            LET (R5) :B= #0  ;RESTORE TRAILINC SEPARATE
9586  032740                                                                  CLRB    (R5)
9587  032740  005737  000446                    IF SIGN0 EQ #0 THEN           TST     SIGN0
9588  032744  001004                                                          BNE     $51301
9589  032746
9590  032746  112737  000053  062367              LET DSBUF1-1 :B= #53       MOVB    #53,DSBUF1-1
9591  032754
9592  032754  000403                            ELSE                          BR      $51302
9593  032756                                                          $51301:
9594  032756
9595  032756  112737  000055  062367              LET DSBUF1-1 :B= #55       MOVB    #55,DSBUF1-1
9596  032764
9597  032764                                    ENDIF
9598  032764                                                          $51302:
9599  032764                                  ENDSELECT
9600                                                                  $51265:
9601                      ;INCR TEMP1 FROM #1 TO #5 BY #1       SRC2 DATA TYPES
9602  032764              INLINE <CLR @#TEMP1>
9603  032764  005037  000476                                                  CLR @#TEMP1
9604  032770              INLINE <INC2: INC TEMP1>
9605  032770  005237  000476                                                  INC2: INC TEMP1
9606  032774              IF TEMP1 GT #5 THEN
9607  032774  023727  000476  000005                                          CMP     TEMP1,#5
9608  033002  003402                                                         BLE     $51303
9609  033004                INLINE <JMP END2>
```

```
 9610  033004  000137  034242                                                        JMP END2
 9611  033010                        ENDIF
 9612  033010                                                                  $51303:
 9613
 9614                                  ;+
 9615                                  ;  RESTORE MSD & LSD OF DSBUF2
 9616                                  ;-
 9617
 9618  033010                        LET DSBUF2 :B= DSTMP2
 9619  033010  113737  000554  062432                                                MOVB    DSTMP2,DSBUF2
 9620  033016                        LET TEMP3 := #DSBUF2-1 + DATA02
 9621  033016  012737  062431  000502                                                MOV     #DSBUF2-1,TEMP3
 9622  033024  063737  000564  000502                                                ADD     DATA02,TEMP3
 9623  033032                        LET @TEMP3 :B= DSTMP3
 9624  033032  113777  000555  145442                                                MOVB    DSTMP3,@TEMP3
 9625
 9626                                  ;+
 9627                                  ;  SIGN DSBUF2 BY DATA TYPE
 9628                                  ;-
 9629
 9630  033040                        SELECT TEMP1 OF 5
 9631  033040  013746  000476                                                        MOV     TEMP1,-(SP)
 9632  033044  006316                                                                ASL     (SP)
 9633  033046  060716                                                                ADD     PC,(SP)
 9634  033050  063607                                                                ADD     @(SP)+,PC
 9635  033052                                                                  $51304:
 9636  033052  000012                                                                .WORD   $51312-$51304
 9637  033054  000052                                                                .WORD   $51311-$51304
 9638  033056  000116                                                                .WORD   $51310-$51304
 9639  033060  000162                                                                .WORD   $51307-$51304
 9640  033062  000226                                                                .WORD   $51306-$51304
 9641  033064                        CASE 1
 9642  033064                                                                  $51312:
 9643  033064
 9644  033064  013737  000564  000620                                                MOV     DATA02,DESCR2
 9645  033072                        IF SIGN1 EQ #0 THEN
 9646  033072  005737  000450                                                        TST     SIGN1
 9647  033076  001004                                                                BNE     $51313
 9648  033100
 9649  033100  152777  000060  145374                                                BISB    #60,@TEMP3
 9650  033106                        ELSE
 9651  033106  000403                                                                BR      $51314
 9652  033110                                                                  $51313:
 9653  033110
 9654  033110  152777  000160  145364                                                BISB    #160,@TEMP3
 9655  033116                        ENDIF
 9656  033116                                                                  $51314:
 9657  033116
 9658  033116  105037  062431                                                        CLRB    DSBUF2-1
 9659
 9660  033122                        CASE 2
 9661  033122  000512                                                                BR      $51305
 9662  033124                                                                  $51311:
 9663  033124
 9664  033124  013737  000564  000620                                                MOV     DATA02,DESCR2
 9665  033132  052737  020000  000620                                                BIS     #20000,DESCR2
```

```
9666  033140                                LET R5 :B= DSTMP3
9667  033140  113705  000555                                                  MOVB    DSTMP3,R5
9668  033144                                IF SIGN1 EQ #-1 THEN
9669  033144  023727  000450  177777                                         CMP     SIGN1,#-1
9670  033152  001002                                                         BNE     $51315
9671  033154                                 LET R5 := R5 + #10.
9672  033154  062705  000012                                                 ADD     #10.,R5
9673  033160                                ENDIF
9674  033160                                                          $51315:
9675  033160                                LET @TEMP3 :B= OVPNCH(R5)
9676  033160  116577  055254  145314                                         MOVB    OVPNCH(R5),@TEMP
9677
9678  033166                              CASE 3
9679  033166  000470                                                         BR      $51305
9680  033170                                                          $51310:
9681  033170                             LET DESCR2 := DATA02 SET.BY #30000  ;LEADING OVERPUNCH
9682  033170  013737  000564  000620                                         MOV     DATA02,DESCR2
9683  033176  052737  030000  000620                                         BIS     #30000,DESCR2
9684  033204                                LET R5 :B= DSTMP2
9685  033204  113705  000554                                                MOVB    DSTMP2,R5
9686  033210                                IF SIGN1 EQ #-1 THEN
9687  033210  023727  000450  177777                                         CMP     SIGN1,#-1
9688  033216  001002                                                         BNE     $51316
9689  033220                                 LET R5 := R5 + #10.
9690  033220  062705  000012                                                 ADD     #10.,R5
9691  033224                                ENDIF
9692  033224                                                          $51316:
9693  033224                                LET DSBUF2 :B= OVPNCH(R5)
9694  033224  116537  055254  062432                                         MOVB    OVPNCH(R5),DSBUF
9695
9696  033232                              CASE 4
9697  033232  000446                                                         BR      $51305
9698  033234                                                          $51307:
9699  033234                             LET DESCR2 := DATA02 SET.BY #40000  ;TRAILING SEPARATE
9700  033234  013737  000564  000620                                         MOV     DATA02,DESCR2
9701  033242  052737  040000  000620                                         BIS     #40000,DESCR2
9702  033250                                LET R5 := TEMP3 + #1
9703  033250  013705  000502                                                 MOV     TEMP3,R5
9704  033254  005205                                                         INC     R5
9705  033256                                IF SIGN1 EQ #0 THEN
9706  033256  005737  000450                                                 TST     SIGN1
9707  033262  001003                                                         BNE     $51317
9708  033264                                 LET (R5) :B= #53
9709  033264  112715  000053                                                MOVB    #53,(R5)
9710  033270                                ELSE
9711  033270  000402                                                         BR      $51320
9712  033272                                                          $51317:
9713  033272                                 LET (R5) :B= #55
9714  033272  112715  000055                                                MOVB    #55,(R5)
9715  033276                                ENDIF
9716  033276                                                          $51320:
9717
9718  033276                              CASE 5
9719  033276  000424                                                         BR      $51305
9720  033300                                                          $51306:
9721  033300                             LET DESCR2 := DATA02 SET.BY #50000  ;LEADING SEPARATE
```

```
 9722  033300  013737  000564  000620                                          MOV     DATA02,DESCR2
 9723  033306  052737  050000  000620                                          BIS     #50000,DESCR2
 9724  033314
 9725  033314  013705  000502                    LET R5 := TEMP3 + #1          MOV     TEMP3,R5
 9726  033320  005205                                                          INC     R5
 9727  033322
 9728  033322  105015                            LET (R5) :B= #0               CLRB    (R5)
 9729  033324
 9730  033324  005737  000450                    IF SIGN1 EQ #0 THEN           TST     SIGN1
 9731  033330  001004                                                          BNE     $51321
 9732  033332
 9733  033332  112737  000053  062431             LET DSBUF2-1 :B= #53          MOVB    #53,DSBUF2-1
 9734  033340
 9735  033340  000403                            ELSE                          BR      $51322
 9736  033342                                                          $51321:
 9737  033342
 9738  033342  112737  000055  062431             LET DSBUF2-1 :B= #55          MOVB    #55,DSBUF2-1
 9739  033350
 9740  033350                                    ENDIF
 9741  033350                                                          $51322:
 9742  033350                                  ENDSELECT
 9743                                                                  $51305:
 9744
 9745  033350                                    ;INCR DATTYP FROM #1 TO #5 BY #1    ;DS.EXP LOOP
 9746  033350  005037  000462                     INLINE <CLR @#DATTYP>         CLR @#DATTYP
 9747  033354
 9748  033354  005237  000462                     INLINE <INC3: INC DATTYP>     INC3: INC DATTYP
 9749  033360
 9750  033360  023727  000462  000005             IF DATTYP GT #5 THEN          CMP     DATTYP,#5
 9751  033366  003402                                                          BLE     $51323
 9752  033370
 9753  033370  000137  034236                      INLINE <JMP END3>            JMP END3
 9754  033374
 9755  033374                                    ENDIF                                 $51323:
 9756
 9757                                              ;+
 9758                                              ;       RESTORE MSD & LSD OF DS.EXP
 9759                                              ;-
 9760
 9761  033374                                     LET DS.EXP :B= DSTMP4     ;MSD
 9762  033374  113737  000556  062536                                          MOVB    DSTMP4,DS.EXP
 9763  033402                                     LET TEMP4 := #DS.EXP-1 + DATA04
 9764  033402  012737  062535  000504                                          MOV     #DS.EXP-1,TEMP4
 9765  033410  063737  000570  000504                                          ADD     DATA04,TEMP4
 9766  033416
 9767  033416  113777  000557  145060             LET @TEMP4 :B= DSTMP5     ;LSD  MOVB    DSTMP5,@TEMP4
 9768
 9769                                              ;+
 9770                                              ;       SIGN DS.EXP BY DATA TYPE
 9771                                              ;-
 9772
 9773  033424                                   SELECT DATTYP OF 5
 9774  033424  013746  000462                                                  MOV     DATTYP,-(SP)
 9775  033430  006316                                                          ASL     (SP)
 9776  033432  060716                                                          ADD     PC,(SP)
 9777  033434  063607                                                          ADD     @(SP)+,PC
```

```
 9778  033436
 9779  033436  000012
 9780  033440  000060
 9781  033442  000136
 9782  033444  000214
 9783  033446  000260
 9784  033450                          CASE 1
 9785  033450
 9786  033450
 9787  033450  013737  000570  000624   LET DESCR4 := DATA04              ;SIGNED ZONED
 9788  033456                          IF DATA04 NE #0 THEN
 9789  033456  005737  000570
 9790  033462  001414
 9791  033464                             IF SIGN2 EQ #0 THEN
 9792  033464  005737  000452
 9793  033470  001004
 9794  033472                              LET @TEMP4 :B= @TEMP4 SET.BY #60
 9795  033472  152777  000060  145004     ELSE
 9796  033500
 9797  033500  000403
 9798  033502                              LET @TEMP4 :B= @TEMP4 SET.BY #160
 9799  033502
 9800  033502  152777  000160  144774     ENDIF
 9801  033510
 9802  033510                             LET DS.EXP-1 :B- #0
 9803  033510
 9804  033510  105037  062535           ENDIF
 9805  033514
 9806  033514
 9807
 9808  033514                          CASE 2
 9809  033514  000524
 9810  033516                           LET DESCR4 :  DATA04 SET.BY #20000 ;TRAILING OVERPUNCH
 9811  033516
 9812  033516  013737  000570  000624
 9813  033524  052737  020000  000624
 9814  033532                            IF DATA04 NE #0 THEN
 9815  033532  005737  000570
 9816  033536  001415
 9817  033540                              LET R5 :B= DSTMP5
 9818  033540  113705  000557
 9819  033544                              LET R5 := R5 - #60
 9820  033544  162705  000060
 9821  033550                              IF SIGN2 EQ #-1 THEN
 9822  033550  023727  000452  177777
 9823  033556  001002
 9824  033560                               LET R5 := R5 + #10.
 9825  033560  062705  000012
 9826  033564                              ENDIF
 9827  033564
 9828  033564                              LET @TEMP4 :B  OVPNCH(R5)
 9829  033564  116577  055254  144712
 9830  033572                            ENDIF
 9831  033572
 9832
 9833  033572                          CASE 3
```

```
$51324:
        .WORD   $51332-$51324
        .WORD   $51331-$51324
        .WORD   $51330-$51324
        .WORD   $51327-$51324
        .WORD   $51326-$51324
$51332:
        MOV     DATA04,DESCR4
        TST     DATA04
        BEQ     $51333
        TST     SIGN2
        BNE     $51334
        BISB    #60,@TEMP4
        BR      $51335
$51334:
        BISB    #160,@TEMP4
$51335:
        CLRB    DS.EXP-1
$51333:
        BR      $51325
$51331:
        MOV     DATA04,DESCR4
        BIS     #20000,DESCR4
        TST     DATA04
        BEQ     $51336
        MOVB    DSTMP5,R5
        SUB     #60,R5
        CMP     SIGN2,#-1
        BNE     $51337
        ADD     #10.,R5
$51337:
        MOVB    OVPNCH(R5),@TEMP
$51336:
```

```
 9834  033572  000475                                                                  BR      $51325
 9835  033574                                                                $51330:
 9836  033574                          LET DESCR4 := DATA04 SET.BY #30000 ;LEADING OVERPUNCH
 9837  033574  013737  000570  000624                                                  MOV     DATA04,DESCR4
 9838  033602  052737  030000  000624                                                  BIS     #30000,DESCR4
 9839  033610                           IF DATA04 NE #0 THEN
 9840  033610  005737  000570                                                         TST     DATA04
 9841  033614  001415                                                                 BEQ     $51340
 9842  033616                             LET R5 :B= DSTMP4
 9843  033616  113705  000556                                                         MOVB    DSTMP4,R5
 9844  033622                             LET R5 := R5 - #60
 9845  033622  162705  000060                                                         SUB     #60,R5
 9846  033626                             IF SIGN2 EQ #-1 THEN
 9847  033626  023727  000452  177777                                                 CMP     SIGN2,#-1
 9848  033634  001002                                                                 BNE     $51341
 9849  033636                               LET R5 := R5 + #10.
 9850  033636  062705  000012                                                         ADD     #10.,R5
 9851  033642                             ENDIF
 9852  033642                                                                $51341:
 9853  033642                             LET DS.EXP :B= OVPNCH(R5)
 9854  033642  116537  055254  062536                                                 MOVB    OVPNCH(R5),DS.EX
 9855  033650                           ENDIF
 9856  033650                                                                $51340:
 9857
 9858  033650                          CASE 4
 9859  033650  000446                                                                 BR      $51325
 9860  033652                                                                $51327:
 9861  033652                          LET DESCR4 := DATA04 SET.BY #40000 ;TRAILING SEPARATE
 9862  033652  013737  000570  000624                                                 MOV     DATA04,DESCR4
 9863  033660  052737  040000  000624                                                 BIS     #40000,DESCR4
 9864  033666                             LET R5 := TEMP4 + #1
 9865  033666  013705  000504                                                         MOV     TEMP4,R5
 9866  033672  005205                                                                 INC     R5
 9867  033674                             IF SIGN2 EQ #0 THEN
 9868  033674  005737  000452                                                         TST     SIGN2
 9869  033700  001003                                                                 BNE     $51342
 9870  033702                               LET (R5) :B= #53
 9871  033702  112715  000053                                                         MOVB    #53,(R5)
 9872  033706                             ELSE
 9873  033706  000402                                                                 BR      $51343
 9874  033710                                                                $51342:
 9875  033710                               LET (R5) :B= #55
 9876  033710  112715  000055                                                         MOVB    #55,(R5)
 9877  033714                             ENDIF
 9878  033714                                                                $51343:
 9879
 9880  033714                          CASE 5
 9881  033714  000424                                                                 BR      $51325
 9882  033716                                                                $51326:
 9883  033716                          LET DESCR4 := DATA04 SET.BY #50000
 9884  033716  013737  000570  000624                                                 MOV     DATA04,DESCR4
 9885  033724  052737  050000  000624                                                 BIS     #50000,DESCR4
 9886  033732                             LET R5 := TEMP4 + #1
 9887  033732  013705  000504                                                         MOV     TEMP4,R5
 9888  033736  005205                                                                 INC     R5
 9889  033740                             LET (R5) :B= #0
```

```
 9890  033740  105015                                                                    CLRB    (R5)
 9891  033742                                  IF SIGN2 EQ #0 THEN
 9892  033742  005737  000452                                                           TST     SIGN2
 9893  033746  001004                                                                   BNE     $51344
 9894  033750                                   LET DS.EXP-1 :B= #53
 9895  033750  112737  000053  062535                                                   MOVB    #53,DS.EXP-1
 9896  033756                                  ELSE
 9897  033756  000403                                                                   BR      $51345
 9898  033760                                                                  $51344:
 9899  033760                                   LET DS.EXP-1 :B= #55
 9900  033760  112737  000055  062535                                                   MOVB    #55,DS.EXP-1
 9901  033766                                  ENDIF
 9902  033766                                                                  $51345:
 9903  033766                                ENDSELECT
 9904  033766                                                                  $51325:
 9905
 9906                                          ;+
 9907                                          ;       CLR DS.DST & LOAD DESCRIPTORS
 9908                                          ;-
 9909
 9910  033766                                  LET R0 := #DS.DST-1
 9911  033766  012700  062473                                                           MOV     #DS.DST-1,R0
 9912  033772
 9913  033772  012701  000041                  LET R1 := #41                           MOV     #41,R1
 9914  033776
 9915  033776  105020                          INLINE <DOIT1:  CLRB    (R0)+>          DOIT1:  CLRB    (R0)+
 9916  034000
 9917  034000  077102                          INLINE <SOB     R1,     DOIT1>          SOB     R1,     DOIT1
 9918  034002
 9919  034002  013700  000614                  LET R0 := DESCR0                        MOV     DESCR0,R0
 9920  034006
 9921  034006  013701  000616                  LET R1 := DESCR1                        MOV     DESCR1,R1
 9922  034012
 9923  034012  013702  000620                  LET R2 := DESCR2                        MOV     DESCR2,R2
 9924  034016
 9925  034016  013703  000622                  LET R3 := DESCR3                        MOV     DESCR3,R3
 9926  034022
 9927  034022  013704  000624                  LET R4 := DESCR4                        MOV     DESCR4,R4
 9928  034026
 9929  034026  013705  000626                  LET R5 := DESCR5                        MOV     DESCR5,R5
 9930  034032
 9931  034032  010437  000532                  LET R4.EXP := R4                        MOV     R4,R4.EXP
 9932  034036
 9933  034036  010537  000534                  LET R5.EXP := R5                        MOV     R5,R5.EXP
 9934  034042
 9935  034042  076050                          INLINE <ADDN>                           ADDN
 9936
 9937                                          ;+
 9938                                          ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
 9939                                          ;-
 9940
 9941  034044                                  LET CC := PSW
 9942  034044  013737  177776  000516                                                   MOV     PSW,CC
 9943  034052
 9944  034052  042737  177760  000516          LET CC := CC CLR.BY #177760             BIC     #177760,CC
 9945  034060                                  IF CC NE CC.EXP THEN
```

```
 9946  034060  023737  000516  000520                                          CMP     CC,CC.EXP
 9947  034066  001402                                                          BEQ     $51346
 9948  034070                                CALL ERROR
 9949  034070  004737  056274                                                  JSR     PC,ERROR
 9950  034074                              ENDIF
 9951  034074                                                              $51346:
 9952  034074                              IF R0 NE R0.EXP THEN
 9953  034074  020037  000522                                                  CMP     R0,R0.EXP
 9954  034100  001402                                                          BEQ     $51347
 9955  034102                                CALL ERROR
 9956  034102  004737  056274                                                  JSR     PC,ERROR
 9957  034106                              ENDIF
 9958  034106                                                              $51347:
 9959  034106                              IF R1 NE R1.EXP THEN
 9960  034106  020137  000524                                                  CMP     R1,R1.EXP
 9961  034112  001402                                                          BEQ     $51350
 9962  034114                                CALL ERROR
 9963  034114  004737  056274                                                  JSR     PC,ERROR
 9964  034120                              ENDIF
 9965  034120                                                              $51350:
 9966  034120                              IF R2 NE R2.EXP THEN
 9967  034120  020237  000526                                                  CMP     R2,R2.EXP
 9968  034124  001402                                                          BEQ     $51351
 9969  034126                                CALL ERROR
 9970  034126  004737  056274                                                  JSR     PC,ERROR
 9971  034132                              ENDIF
 9972  034132                                                              $51351:
 9973  034132                              IF R3 NE R3.EXP THEN
 9974  034132  020337  000530                                                  CMP     R3,R3.EXP
 9975  034136  001402                                                          BEQ     $51352
 9976  034140                                CALL ERROR
 9977  034140  004737  056274                                                  JSR     PC,ERROR
 9978  034144                              ENDIF
 9979  034144                                                              $51352:
 9980  034144                              IF R4 NE R4.EXP THEN
 9981  034144  020437  000532                                                  CMP     R4,R4.EXP
 9982  034150  001402                                                          BEQ     $51353
 9983  034152                                CALL ERROR
 9984  034152  004737  056274                                                  JSR     PC,ERROR
 9985  034156                              ENDIF
 9986  034156                                                              $51353:
 9987  034156                              IF R5 NE R5.EXP THEN
 9988  034156  020537  000534                                                  CMP     R5,R5.EXP
 9989  034162  001402                                                          BEQ     $51354
 9990  034164                                CALL ERROR
 9991  034164  004737  056274                                                  JSR     PC,ERROR
 9992  034170                              ENDIF
 9993  034170                                                              $51354:
 9994
 9995                                    ;+
 9996                                    ;       CHECK RESULTS VS EXPECTED RESULTS
 9997                                    ;-
 9998
 9999  034170                            LET R0 := #DS.DST-1
10000  034170  012700  062473                                                  MOV     #DS.DST-1,R0
10001  034174                            LET R1 := #DS.EXP-1
```

```
10002  034174  012701  062535                    LET ERRFLG := #0                                  MOV     #DS.EXP-1,R1
10003  034200
10004  034200  005037  000454                    WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO        CLR     ERRFLG
10005  034204                                                                                  $51355:
10006  034204                                                                                          CMP     R0,#DS.DST+40
10007  034204  020027  062534                                                                        BEQ     $51356
10008  034210  001410                                                                                TST     ERRFLG
10009  034212  005737  000454                                                                        BNE     $51356
10010  034216  001005
10011  034220                                     IFB (R0)+ NE (R1)+ THEN                          CMPB    (R0)+,(R1)+
10012  034220  122021                                                                              BEQ     $51357
10013  034222  001402
10014  034224                                      CALL ERROR                                      JSR     PC,ERROR
10015  034224  004737  056274
10016  034230                                     ENDIF                                    $51357:
10017  034230
10018  034230                                     ENDDO                                            BR      $51355
10019  034230  000765                                                                      $51356:
10020  034232
10021                                            ;ENDINC
10022  034232                                     INLINE <JMP INC3>                                JMP INC3
10023  034232  000137  033354
10024  034236                                     INLINE <END3:>                                   END3:
10025  034236
10026                                           ;ENDINC
10027  034236                                   INLINE <JMP INC2>                                  JMP INC2
10028  034236  000137  032770
10029  034242                                   INLINE <END2:>                                     END2:
10030  034242
10031                                           ;ENDINC
10032  034242                                   INLINE <JMP INC1>                                  JMP INC1
10033  034242  000137  032404
10034  034246                                   INLINE <END1:>                                     END1:
10035  034246
10036  034246                                   LET TSTCAS := TSTCAS + #22                         ADD     #22,TSTCAS
10037  034246  062737  000022  000542
10038  034254                                   LET COUNT := COUNT - #1                            DEC     COUNT
10039  034254  005337  000466
10040                                           ;UNTIL COUNT EQ #0
10041  034260                                   IF COUNT NE #0 THEN                                TST     COUNT
10042  034260  005737  000466                                                                    BEQ     $51360
10043  034264  001402
10044  034266                                    INLINE <JMP $5050>                               JMP $5050
10045  034266  000137  032036
10046  034272                                   ENDIF
10047  034272                                                                            $51360:
10048
10049                                           ;+
10050                                           ;       INLINE CASE - ADDNI, USING UNSIGNED ZONED DATA
10051                                           ;-
10052
10053  034272                                   CALL CLRDSB
10054  034272  004737  055520                                                                    JSR     PC,CLRDSB
10055
10056                                           ;+
10057                                           ;       LOAD DSBUF1
```

```
10058                                   ;-
10059
10060  034276                           LET R0 := #ADD1+2                       ;SOURCE
10061  034276  012700  063360                                                                MOV     #ADD1+2,R0
10062  034302                           LET R1 := TADDI CLR.BY #10000           ;# OF BYTES TO XFER
10063  034302  013701  064052                                                                MOV     TADDI,R1
10064  034306  042701  010000                                                                BIC     #10000,R1
10065  034312                           LET R2 := #DSBUF1                       ;DESTINATION
10066  034312  012702  062370                                                                MOV     #DSBUF1,R2
10067  034316                           INLINE  <1$:    MOVB    (R0)+,  (R2)+>
10068  034316  112022                                                          1$:     MOVB    (R0)+,
10069  034320                           INLINE  <       SOB     R1,     1$>
10070  034320  077102                                                                  SOB     R1,
10071
10072                                   ;+
10073                                   ;       LOAD DSBUF2
10074                                   ;-
10075
10076  034322                           LET R0 := #ADD1A+2
10077  034322  012700  063402                                                                MOV     #ADD1A+2,R0
10078  034326                           LET R1 := TADDI+4 CLR.BY #10000
10079  034326  013701  064056                                                                MOV     TADDI+4,R1
10080  034332  042701  010000                                                                BIC     #10000,R1
10081  034336                           LET R2 := #DSBUF2
10082  034336  012702  062432                                                                MOV     #DSBUF2,R2
10083  034342                           INLINE  <2$:    MOVB    (R0)+,  (R2)+>
10084  034342  112022                                                          2$:     MOVB    (R0)+,
10085  034344                           INLINE  <       SOB     R1,     2$>
10086  034344  077102                                                                  SOB     R1,
10087
10088                                   ;+
10089                                   ;       LOAD DS.EXP
10090                                   ;-
10091
10092  034346                           LET R0 := #ADD1B+2
10093  0343                     063426                                                        MOV     #ADD1B+2,R0
10094  0343
10095  0343                     064062                                                        MOV     TADDI+10,R1
10096  034356                   010000                                                        BIC     #10000,R1
10097  034362                           LET R2 := #DS.EXP
10098  034362  012702  062536                                                                MOV     #DS.EXP,R2
10099  034366                           INLINE  <3$:    MOVB    (R0)+,  (R2)>
10100  034366  112012                                                          3$:     MOVB    (R0)+,
10101  034370                           INLINE  <       BISB    #60,    (R2)+>
10102  034370  152722  000060                                                                BISB    #60,
10103  034374                           INLINE  <       SOB     R1,     3$>
10104  034374  077104                                                                  SOB     R1,
10105
10106  034376                           CALL CLRREG                             ;ENSURE R0-R5 ARE CLR
10107  034376  004737  055330                                                        JSR     PC,CLRREG
10108
10109  034402                           INLINE <ADDNI>
10110  034402  076150                                                          ADDNI
10111  034404                           INLINE <.WORD TADDI>
10112  034404  064052                                                          .WORD TADDI
10113  034406                           INLINE <.WORD TADDI+4>
```

```
10114  034406  064056                                                                  .WORD TADDI+4
10115  034410                          INLINE <.WORD TADDI+10>
10116  034410  064062                                                                  .WORD TADDI+10
10117  034412                          LET CC := PSW
10118  034412  013737  177776  000516                                                  MOV     PSW,CC
10119  034420                          LET CC := CC CLR.BY #177760
10120  034420  042737  177760  000516                                                  BIC     #177760,CC
10121  034426                          IF CC NE #0 THEN
10122  034426  005737  000516                                                         TST     CC
10123  034432  001402                                                                 BEQ     $51361
10124  034434                           CALL ERROR
10125  034434  004737  056274                                                         JSR     PC,ERROR
10126  034440                          ENDIF
10127  034440                                                                  $51361:
10128
10129                                   ;+
10130                                   ;       ENSURE GPR'S STILL ZERO
10131                                   ;-
10132
10133  034440                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
10134  034440  005700                                                                 TST     R0
10135  034442  001004                                                                 BNE     $51362
10136  034444  005701                                                                 TST     R1
10137  034446  001002                                                                 BNE     $51362
10138  034450  005702                                                                 TST     R2
10139  034452  001402                                                                 BEQ     $51363
10140  034454                                                                  $51362:
10141  034454                           CALL ERROR
10142  034454  004737  056274                                                         JSR     PC,ERROR
10143  034460                          ENDIF
10144  034460                                                                  $51363:
10145  034460                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
10146  034460  005703                                                                 TST     R3
10147  034462  001004                                                                 BNE     $51364
10148  034464  005704                                                                 TST     R4
10149  034466  001002                                                                 BNE     $51364
10150  034470  005705                                                                 TST     R5
10151  034472  001402                                                                 BEQ     $51365
10152  034474                                                                  $51364:
10153  034474                           CALL ERROR
10154  034474  004737  056274                                                         JSR     PC,ERROR
10155  034500                          ENDIF
10156  034500                                                                  $51365:
10157
10158                                   ;+
10159                                   ;       CHECK RESULTS
10160                                   ;-
10161
10162  034500                          LET R0 := #DS.DST
10163  034500  012700  062474                                                         MOV     #DS.DST,R0
10164  034504                          LET R1 := #DS.EXP               ;EXPECTED DATA
10165  034504  012701  062536                                                         MOV     #DS.EXP,R1
10166  034510                          LET ERRFLG := #0
10167  034510  005037  000454                                                         CLR     ERRFLG
10168  034514                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
10169  034514                                                                  $51366:
```

```
 10170  034514  020027  062534                                                  CMP     R0,#DS.DST+40
 10171  034520  001410                                                          BEQ     $51367
 10172  034522  005737  000454                                                  TST     ERRFLG
 10173  034526  001005                                                          BNE     $51367
 10174  034530                        IFB (R0)+ NE (R1)+ THEN
 10175  034530  122021                                                          CMPB    (R0)+,(R1)+
 10176  034532  001402                                                          BEQ     $51370
 10177  034534                         CALL ERROR
 10178  034534  004737  056274                                                  JSR     PC,ERROR
 10179  034540                        ENDIF
 10180  034540                                                          $51370:
 10181  034540                       ENDDO
 10182  034540  000765                                                          BR      $51366
 10183  034542                                                          $51367:
 10184
 10185
```

```
10186                                   .SBTTL  SUBN
10187                                   ;*****************************************************************
10188                                   ;
10189                                   ;       SUBN TEST
10190                                   ;
10191                                   ;*****************************************************************
10192
10193  034542                           INLINE <XSUBN:>
10194  034542                                                                          XSUBN:
10195  034542                           INLINE <SCOPE>
10196  034542  000004                                                                  SCOPE
10197  034544                           LET $TIMES := #10              ;ITERATION COUNT
10198  034544  012737  000010  000404                                                 MOV     #10,$TIMES
10199  034552                           LET COUNT := TADD              ;# OF TEST CASES
10200  034552  013737  063200  000466                                                 MOV     TADD,COUNT
10201  034560                           LET TSTCAS := #TADD+2          ;POINT TO FIRST TEST CASE
10202  034560  012737  063202  000542                                                 MOV     #TADD+2,TSTCAS
10203
10204                                   ;+
10205                                   ;       CLR R0.EXT TO R3.EXP
10206                                   ;-
10207
10208  034566                           INCR  R0 FROM #0 TO #6 BY #2
10209  034566  005000                                                                 CLR     R0
10210  034570  000402                                                                 BR      $51371
10211  034572                                                                  $51372:
10212  034572  062700  000002                                                        ADD     #2,R0
10213  034576                                                                  $51371:
10214  034576  020027  000006                                                        CMP     R0,#6
10215  034602  003003                                                                BGT     $51373
10216  034604                            INLINE <CLR R0.EXP(R0)>
10217  034604  005060  000522                                                        CLR R0.EXP(R0)
10218  034610                           ENDINC
10219  034610  000770                                                                BR      $51372
10220  034612                                                                  $51373:
10221
10222  034612                           ;REPEAT OUTER LOOP FOR TEST CASES
10223  034612                           INLINE <$5051:>
10224  034612                                                                          $5051:
10225  034612  004737  055520            CALL CLRDSB                    ;CLR DS BUFFERS
10226                                                                                  JSR     PC,CLRDSB
10227                                    ;+
10228                                    ;      LOAD DATAXX AND CC.EXP FROM TEST CASE
10229                                    ;-
10230
10231  034616                            LET R0 := TSTCAS
10232  034616  013700  000542                                                        MOV     TSTCAS,R0
10233  034622                            LET DATA00 := (R0)+            ;SRC1 LENGTH
10234  034622  012037  000560                                                        MOV     (R0)+,DATA00
10235  034626                            LET DATA01 := (R0)+            ;POINTER TO SRC1 DATA
10236  034626  012037  000562                                                        MOV     (R0)+,DATA01
10237  034632                            LET DATA02 := (R0)+            ;SRC2 LENGTH
10238  034632  012037  000564                                                        MOV     (R0)+,DATA02
10239  034636                            LET DATA03 := (R0)+            ;POINTER TO SRC2 DATA
10240  034636  012037  000566                                                        MOV     (R0)+,DATA03
10241  034642                            LET DATA04 := (R0)+            ;DEST LENGTH
```

```
10242  034642  012037  000570                                                          MOV     (R0)+,DATA04
10243  034646
10244  034646  012037  000572                                                          MOV     (R0)+,DATA05
10245  034652
10246  034652  012037  000520                                                          MOV     (R0)+,CC.EXP
10247  034656
10248  034656  012037  000572                                                          MOV     (R0)+,DATA05
10249  034662
10250  034662  012037  000520                                                          MOV     (R0)+,CC.EXP
10251
10252                                  ;+
10253                                  ;       LOAD DSBUF1
10254                                  ;-
10255
10256  034666                          IF DATA00 NE #0 THEN            ;CHECK FOR ZERO LENGTH BUFFER
10257  034666  005737  000560                                                          TST     DATA00
10258  034672  001413                                                                  BEQ     $51374
10259  034674
10260  034674  013700  000562          LET R0 := DATA01                                MOV     DATA01,R0
10261  034700
10262  034700  012037  000446          LET SIGN0 := (R0)+              ;STORE SIGN AND POINT AT FIRST BYTE
                                                                                      MOV     (R0)+,SIGN0
10263  034704
10264  034704  013701  000560          LET R1 := DATA00                ;# OF BYTES TO TRANSFER
10265  034710                                                                        MOV     DATA00,R1
10266  034710  012702  062370          LET R2 := #DSBUF1               ;TRANSFER DESTINATION
10267  034714                                                                        MOV     #DSBUF1,R2
10268  034714          INLINE <1$:>                                                  1$:
10269  034714
10270  034714  112022                  INLINE <MOVB (R0)+,(R2)+>                     MOVB (R0)+,(R2)+
10271  034716
10272  034716  077102                  INLINE <SOB R1,1$>                            SOB R1,1$
10273  034720
10274  034720  000402                  ELSE                                          BR      $51375
10275  034722                                                                $51374:
10276  034722          LET SIGN0 := #0                                               CLR     SIGN0
10277  034722  005037  000446
10278  034726          ENDIF                                                 $51375:
10279  034726
10280
10281                                  ;+
10282                                  ;       LOAD DSBUF2
10283                                  ;-
10284
10285  034726                          IF DATA02 NE #J THEN                                    .
10286  034726  005737  000564                                                          TST     DATA02
10287  034732  001413                                                                  BEQ     $51376
10288  034734
10289  034734  013700  000566          LET R0 := DATA03                                MOV     DATA03,R0
10290  034740
10291  034740  012037  000450          LET SIGN1 := (R0)+                              MOV     (R0)+,SIGN1
10292  034744
10293  034744  013701  000564          LET R1 := DATA02                                MOV     DATA02,R1
10294  034750
10295  034750  012702  062432          LET R2 := #DSBUF2                               MOV     #DSBUF2,R2
10296  034754
10297  034754          INLINE <2$:>                                                    2$:
```

```
10298  034754                          INLINE <MOVB (R0)+,(R2)+>                       MOVB (R0)+,(R2)+
10299  034754  112022                  INLINE <SOB R1,2$>                              SOB R1,2$
10300  034756
10301  034756  077102                  ELSE
10302  034760                                                                          BR      $51377
10303  034760  000402                                                          $51376:
10304  034762
10305  034762                          LET SIGN1 := #0                                 CLR     SIGN1
10306  034762  005037  000450          ENDIF
10307  034766                                                                  $51377:
10308  034766
10309
10310                                  ;+
10311                                  ;       LOAD DS.EXP
10312                                  ;-
10313
10314  034766                          IF DATA04 NF #0 THEN                            TST     DATA04
10315  034766  005737  000570                                                         BEQ     $51400
10316  034772  001415
10317  034774                          LET R0 := DATA05                                MOV     DATA05,R0
10318  034774  013700  000572          LET SIGN2 := (R0)+                              MOV     (R0)+,SIGN2
10319  035000
10320  035000  012037  000452          LET R1 := DATA04                                MOV     DATA04,R1
10321  035004
10322  035004  013701  000570          LET R2 := #DS.EXP                               MOV     #DS.EXP,R2
10323  035010
10324  035010  012702  062536          INLINE <3$:>                                    3$:
10325  035014
10326  035014                          INLINE <MOVB (R0)+,(R2)>                        MOVB (R0)+,(R2)
10327  035014
10328  035014  112012                  INLINE <BISB  #60,    (R2)+>                    BISB    #60,    (R2)+
10329  035016
10330  035016  152722  000060          INLINE <SOB R1,3$>                              SOB R1,3$
10331  035022
10332  035022  077104                  ELSE
10333  035024                                                                          BR      $51401
10334  035024  000402                                                          $51400:
10335  035026
10336  035026                          LET SIGN2 := #0                                 CLR     SIGN2
10337  035026  005037  000452          ENDIF
10338  035032                                                                  $51401:
10339  035032
10340
10341                                  ;+
10342                                  ;       LOAD DSTMP'S WITH MDS & LSD OF EACH BUFFER
10343                                  ;-
10344
10345  035032                          LET DSTMP0 :B= DSBUF1                           MOVB    DSBUF1,DSTMP0
10346  035032  113737  062370  000552
10347  035040                          LET TEMP0 := #DSBUF1-1 + DATA00                 MOV     #DSBUF1-1,TEMP0
10348  035040  012737  062367  000474                                                 ADD     DATA00,TEMP0
10349  035046  063737  000560  000474
10350  035054                          LET DSTMP1 :B= @TEMP0                           MOVB    @TEMP0,DSTMP1
10351  035054  117737  143414  000553
10352  035062                          LET DSTMP2 :B= DSBUF2                           MOVB    DSBUF2,DSTMP2
10353  035062  113737  062432  000554
```

```
10354  035070
10355  035070  012737  062431  000474          LET TEMP0 := #DSBUF2-1 + DATA02                          MOV     #DSBUF2-1,TEMP0
10356  035076  063737  000564  000474                                                                   ADD     DATA02,TEMP0
10357  035104
10358  035104  117737  143364  000555          LET DSTMP3 :B= @TEMP0                                    MOVB    @TEMP0,DSTMP3
10359  035112
10360  035112  113737  062536  000556          LET DSTMP4 :B= DS.EXP                                    MOVB    DS.EXP,DSTMP4
10361  035120
10362  035120  012737  062535  000474          LET TEMP0 := #DS.EXP-1 + DATA04                          MOV     #DS.EXP-1,TEMP0
10363  035126  063737  000570  000474                                                                   ADD     DATA04,TEMP0
10364  035134
10365  035134  117737  143334  000557          LET DSTMP5 :B= @TEMP0                                    MOVB    @TEMP0,DSTMP5
10366  035142
10367  035142  012737  062370  000616          LET DESCR1 := #DSBUF1                                    MOV     #DSBUF1,DESCR1
10368  035150
10369  035150  012737  062432  000622          LET DESCR3 := #DSBUF2                                    MOV     #DSBUF2,DESCR3
10370  035156
10371  035156  012737  062474  000626          LET DESCR5 := #DS.DST                                    MOV     #DS.DST,DESCR5
10372
10373                                          ; INCR TEMP0 FROM #1 TO #5 BY #1        SRC1 DATA TYPE LOOP
10374  035164                                   INLINE <CLR @#TEMP0>
10375  035164  005037  000474                                                                           CLR @#TEMP0
10376  035170
10377  035170  005237  000474                  INLINE <INC21: INC TEMP0>                                INC21: INC TEMP0
10378  035174
10379  035174  023727  000474  000005          IF TEMP0 GT #5 THEN                                      CMP     TEMP0,#5
10380  035202  003402                                                                                   BLE     $51402
10381  035204
10382  035204  000137  037036                   INLINE <JMP END21>                                       JMP END21
10383  035210
10384  035210                                   ENDIF                                                  $51402:
10385
10386                                           ;+
10387                                           ;    RESTORE MSD & LSD OF DSBUF1
10388                                           ;-
10389
10390  035210                                   LET DSBUF1 :B= DSTMP0          ;MSD
10391  035210  113737  000552  062370                                                                   MOVB    DSTMP0,DSBUF1
10392  035216                                   LET TEMP2 := #DSBUF1-1 + DATA00
10393  035216  012737  062367  000500                                                                   MOV     #DSBUF1-1,TEMP2
10394  035224  063737  000560  000500                                                                   ADD     DATA00,TEMP2
10395  035232                                   LET @TEMP2 :B= DSTMP1          ;LSD
10396  035232  113777  000553  143240                                                                   MOVB    DSTMP1,@TEMP2
10397
10398                                           ;+
10399                                           ;    SIGN DSBUF1 BY DATA TYPE
10400                                           ;-
10401
10402  035240                                   SELECT TEMP0 OF 5
10403  035240  013746  000474                                                                           MOV     TEMP0,-(SP)
10404  035244  006316                                                                                   ASL     (SP)
10405  035246  060716                                                                                   ADD     PC,(SP)
10406  035250  063607                                                                                   ADD     @(SP)+,PC
10407  035252                                                                                         $51403:
10408  035252  000012                                                                                   .WORD   $51411-$51403
10409  035254  000052                                                                                   .WORD   $51410-$51403
```

```
10410  035256  000116                                                                  .WORD   $51407-$51403
10411  035260  000162                                                                  .WORD   $51406-$51403
10412  035262  000226                                                                  .WORD   $51405-$51403
10413  035264                        CASE 1
10414  035264                                                                $51411:
10415  035264                          LET DESCR0 := DATA00          ;SIGNED ZONED
10416  035264  013737  000560  000614                                                 MOV     DATA00,DESCR0
10417  035272                          IF SIGN0 EQ #0 THEN
10418  035272  005737  000446                                                        TST     SIGN0
10419  035276  001004                                                                BNE     $51412
10420  035300                           LET @TEMP2 :B= @TEMP2 SET.BY #60     ;+
10421  035300  152777  000060  143172                                                BISB    #60,@TEMP2
10422  035306                          ELSE
10423  035306  000403                                                                BR      $51413
10424  035310                                                                $51412:
10425  035310                           LET @TEMP2 :B= @TEMP2 SET.BY #160    ;-
10426  035310  152777  000160  143162                                                BISB    #160,@TEMP2
10427  035316                          ENDIF
10428  035316                                                                $51413:
10429  035316                          LET DSBUF1-1 :B= #0           ;FIX LEADING SEPARATE RESULT
10430  035316  105037  062367                                                        CLRB    DSBUF1-1
10431
10432  035322                        CASE 2
10433  035322  000512                                                                BR      $51404
10434  035324                                                                $51410:
10435  035324                          LET DESCR0 := DATA00 SET.BY #20000    ;TRAILING OVERPUNCH
10436  035324  013737  000560  000614                                                 MOV     DATA00,DESCR0
10437  035332  052737  020000  000614                                                 BIS     #20000,DESCR0
10438  035340                          LET R5 :B= DSTMP1     ;GET LSD
10439  035340  113705  000553                                                        MOVB    DSTMP1,R5
10440  035344                          IF SIGN0 EQ #-1 THEN
10441  035344  023727  000446  177777                                                CMP     SIGN0,#-1
10442  035352  001002                                                                BNE     $51414
10443  035354                           LET R5 := R5 + #10.          ;CHANGE INDEX FOR -
10444  035354  062705  000012                                                        ADD     #10.,R5
10445  035360                          ENDIF
10446  035360                                                                $51414:
10447  035360                          LET @TEMP2 :B= OVPNCH(R5)
10448  035360  116577  055254  143112                                                MOVB    OVPNCH(R5),@TEMP
10449
10450  035366                        CASE 3
10451  035366  000470                                                                BR      $51404
10452  035370                                                                $51407:
10453  035370                         LET DESCR0 := DATA00 SET.BY #30000     ;LEADING OVERPUNCH
10454  035370  013737  000560  000614                                                 MOV     DATA00,DESCR0
10455  035376  052737  030000  000614                                                 BIS     #30000,DESCR0
10456  035404                          LET R5 :B= DSTMP0     ;GET MSD
10457  035404  113705  000552                                                        MOVB    DSTMP0,R5
10458  035410                          IF SIGN0 EQ #-1 THEN
10459  035410  023727  000446  177777                                                CMP     SIGN0,#-1
10460  035416  001002                                                                BNE     $51415
10461  035420                           LET R5 := R5 + #10.
10462  035420  062705  000012                                                        ADD     #10.,R5
10463  035424                          ENDIF
10464  035424                                                                $51415:
10465  035424                          LET DSBUF1 :B= OVPNCH(R5)
```

```
10466  035424  116537  055254  062370                                                  MOVB    OVPNCH(R5),DSBUF
10467
10468
10469  035432                          CASE 4
10470  035432  000446                                                                  BR      $51404
10471  035434                                                                  $51406:
10472  035434                           LET DESCR0 := DATA00 SET.BY #40000    ;TRAILING SEPARATE
10473  035434  013737  000560  000614                                                  MOV     DATA00,DESCR0
10474  035442  052737  040000  000614                                                  BIS     #40000,DESCR0
10475  035450
10476  035450  013705  000500           LET R5 := TEMP2 + #1                          MOV     TEMP2,R5
10477  035454  005205                                                                  INC     R5
10478  035456
10479  035456  005737  000446             IF SIGN0 EQ #0 THEN                         TST     SIGN0
10480  035462  001003                                                                  BNE     $51416
10481  035464
10482  035464  112715  000053              LET (R5) :B= #53       ;+ SIGN            MOVB    #53,(R5)
10483  035470
10484  035470  000402                    ELSE                                        BR      $51417
10485  035472                                                                  $51416:
10486  035472
10487  035472  112715  000055              LET (R5) :B= #55       ;- SIGN            MOVB    #55,(R5)
10488  035476
10489  035476                             ENDIF                                $51417:
10490
10491  035476                          CASE 5
10492  035476  000424                                                                  BR      $51404
10493  035500                                                                  $51405:
10494  035500                           LET DESCR0 := DATA00 SET.BY #50000    ;LEADING SEPARATE
10495  035500  013737  000560  000614                                                  MOV     DATA00,DESCR0
10496  035506  052737  050000  000614                                                  BIS     #50000,DESCR0
10497  035514
10498  035514  013705  000500           LET R5 := TEMP2 + #1                          MOV     TEMP2,R5
10499  035520  005205                                                                  INC     R5
10500  035522
10501  035522  105015                     LET (R5) :B= #0  ;RESTORE TRAILING SEPARATE CLRB    (R5)
10502  035524
10503  035524  005737  000446             IF SIGN0 EQ #0 THEN                         TST     SIGN0
10504  035530  001004                                                                  BNE     $51420
10505  035532
10506  035532  112737  000053  062367        LET DSBUF1-1 :B= #53                    MOVB    #53,DSBUF1-1
10507  035540
10508  035540  000403                    ELSE                                        BR      $51421
10509  035542                                                                  $51420:
10510  035542
10511  035542  112737  000055  062367        LET DSBUF1-1 :B= #55                    MOVB    #55,DSBUF1-1
10512  035550
10513  035550                             ENDIF                                $51421:
10514  035550                          ENDSELECT                               $51404:
10515  035550
10516
10517
10518  035550                             ;INCR TEMP1 FROM #1 TO #5 BY #1       SRC2 DATA TYPES
10519  035550  005037  000476             INLINE <CLR @#TEMP1>                        CLR @#TEMP1
10520  035554
10521  035554  005237  000476             INLINE <INC22: INC TEMP1>                   INC22: INC TEMP1
```

```
10522  035560                          IF TEMP1 GT #5 THEN
10523  035560  023727  000476  000005                                          CMP     TEMP1,#5
10524  035566  003402                                                        BLE     $51422
10525  035570                            INLINE <JMP END22>
10526  035570  000137  037032                                                JMP END22
10527  035574                          ENDIF
10528  035574                                                          $51422:
10529  035574                            LET R3 := #DSBUF2
10530  035574  012703  062432                                                MOV     #DSBUF2,R3
10531
10532                                    ;+
10533                                    ;  RESTORE MSD & LSD OF DSBUF2
10534                                    ;-
10535
10536  035600                            LET DSBUF2 :B= DSTMP2
10537  035600  113737  000554  062432                                        MOVB    DSTMP2,DSBUF2
10538  035606                            LET TEMP3 := #DSBUF2-1 + DATA02
10539  035606  012737  062431  000502                                        MOV     #DSBUF2-1,TEMP3
10540  035614  063737  000564  000502                                        ADD     DATA02,TEMP3
10541  035622                            LET @TEMP3 :B= DSTMP3
10542  035622  113777  000555  142652                                        MOVB    DSTMP3,@TEMP3
10543
10544                                    ;+
10545                                    ;  SIGN DSBUF2 BY DATA TYPE
10546                                    ;-
10547
10548  035630                          SELECT TEMP1 OF 5
10549  035630  013746  000476                                                MOV     TEMP1,-(SP)
10550  035634  006316                                                        ASL     (SP)
10551  035636  060716                                                        ADD     PC,(SP)
10552  035640  063607                                                        ADD     @(SP)+,PC
10553  035642                                                          $51423:
10554  035642  000012                                                        .WORD   $51431-$51423
10555  035644  000052                                                        .WORD   $51430-$51423
10556  035646  000116                                                        .WORD   $51427-$51423
10557  035650  000162                                                        .WORD   $51426-$51423
10558  035652  000226                                                        .WORD   $51425-$51423
10559  035654                          CASE 1
10560  035654                                                          $51431:
10561  035654                           LET DESCR2 := DATA02
10562  035654  013737  000564  000620                                        MOV     DATA02,DESCR2
10563  035662                             IF SIGN1 EQ #0 THEN
10564  035662  005737  000450                                                TST     SIGN1
10565  035666  001004                                                        BNE     $51432
10566  035670
10567  035670  152777  000060  142604                                        BISB    #60,@TEMP3
10568  035676                             ELSE
10569  035676  000403                                                        BR      $51433
10570  035700                                                          $51432:
10571  035700                              LET @TEMP3 :B= @TEMP3 SET.BY #160;-
10572  035700  152777  000160  142574                                        BISB    #160,@TEMP3
10573  035706                             ENDIF
10574  035706                                                          $51433:
10575  035706                             LET DSBUF2-1 :B= #0
10576  035706  105037  062431                                                CLRB    DSBUF2-1
10577
```

```
10578  035712
10579  035712  000512                          CASE 2                                                  BR      $51424
10580  035714                                                                                  $51430:
10581  035714                                   LET DESCR2 := DATA02 SET.BY #20000  ;TRAILING OVERPUNCH
10582  035714  013737  000564  000620                                                          MOV     DATA02,DESCR2
10583  035722  052737  020000  000620                                                          BIS     #20000,DESCR2
10584  035730                                     LET R5 :B= DSTMP3
10585  035730  113705  000555                                                                  MOVB    DSTMP3,R5
10586  035734                                     IF SIGN1 EQ #-1 THEN
10587  035734  023727  000450  177777                                                          CMP     SIGN1,#-1
10588  035742  001002                                                                          BNE     $51434
10589  035744                                      LET R5 := R5 + #10.
10590  035744  062705  000012                                                                  ADD     #10.,R5
10591  035750                                     ENDIF
10592  035750                                                                          $51434:
10593  035750                                     LET @TEMP3 :B= OVPNCH(R5)
10594  035750  116577  055254  142524                                                          MOVB    OVPNCH(R5),@TEMP
10595
10596  035756                                   CASE 3
10597  035756  000470                                                                          BR      $51424
10598  035760                                                                          $51427:
10599  035760                                   LET DESCR2 := DATA02 SET.BY #30000  ;LEADING OVERPUNCH
10600  035760  013737  000564  000620                                                          MOV     DATA02,DESCR2
10601  035766  052737  030000  000620                                                          BIS     #30000,DESCR2
10602  035774                                     LET R5 :B= DSTMP2
10603  035774  113705  000554                                                                  MOVB    DSTMP2,R5
10604  036000                                     IF SIGN1 EQ #-1 THEN
10605  036000  023727  000450  177777                                                          CMP     SIGN1,#-1
10606  036006  001002                                                                          BNE     $51435
10607  036010                                      LFT R5 := R5 + #10.
10608  036010  062705  000012                                                                  ADD     #10.,R5
10609  036014                                     ENDIF
10610  036014                                                                          $51435:
10611  036014                                     LET DSBUF2 :B= OVPNCH(R5)
10612  036014  116537  055254  062432                                                          MOVB    OVPNCH(R5),DSBUF
10613
10614  036022                                 CASE 4
10615  036022  000446                                                                          BR      $51424
10616  036024                                                                          $51426:
10617  036024                                   LET DESCR2 := DATA02 SET.BY #40000  ;TRAILING SEPARATE
10618  036024  013737  000564  000620                                                          MOV     DATA02,DESCR2
10619  036032  052737  040000  000620                                                          BIS     #40000,DESCR2
10620  036040                                   LET R5 := TEMP3 + #1
10621  036040  013705  000502                                                                  MOV     TEMP3,R5
10622  036044  005205                                                                          INC     R5
10623  036046                                     IF SIGN1 EQ #0 THEN
10624  036046  005737  000450                                                                  TST     SIGN1
10625  036052  001003                                                                          BNE     $51436
10626  036054                                      LET (R5) :B= #53
10627  036054  112715  000053                                                                  MOVB    #53,(R5)
10628  036060                                     ELSE
10629  036060  000402                                                                          BR      $51437
10630  036062                                                                          $51436:
10631  036062                                      LET (R5) :B= #55
10632  036062  112715  000055                                                                  MOVB    #55,(R5)
10633  036066                                     ENDIF
```

```
10634  036066                                                                          $51437:
10635
10636  036066                          CASE 5
10637  036066  000424                                                                          BR      $51424
10638  036070                                                                          $51425:
10639  036070                           LET DESCR2 := DATA02 SET.BY #50000  ;LEADING SEPARATE
10640  036070  013737  000564  000620                                                         MOV     DATA02,DESCR2
10641  036076  052737  050000  000620                                                         BIS     #50000,DESCR2
10642  036104
10643  036104  013705  000502          LET R5 := TEMP3 + #1                                  MOV     TEMP3,R5
10644  036110  005205                                                                        INC     R5
10645  036112
10646  036112  105015                    LET (R5) :B= #0                                     CLRB    (R5)
10647  036114
10648  036114  005737  000450            IF SIGN1 EQ #0 THEN                                 TST     SIGN1
10649  036120  001004                                                                        BNE     $51440
10650  036122
10651  036122  112737  000053  062431     LET DSBUF2-1 :B= #53                              MOVB    #53,DSBUF2-1
10652  036130
10653  036130  000403                    ELSE                                                BR      $51441
10654  036132                                                                          $51440:
10655  036132
10656  036132  112737  000055  062431     LET DSBUF2-1 :B= #55                              MOVB    #55,DSBUF2-1
10657  036140
10658  036140                            ENDIF
10659  036140                          ENDSELECT                                       $51441:
10660  036140                                                                          $51424:
10661
10662                                  ;INCR DATTYP FROM #1 TO #5 BY #1    ;DS.EXP LOOP
10663  036140                           INLINE <CLR @#DATTYP>
10664  036140  005037  000462                                                                 CLR @#DATTYP
10665  036144                           INLINE <INC23: INC DATTYP>
10666  036144  005237  000462                                                                 INC23: INC DATTYP
10667  036150                           IF DATTYP GT #5 THEN
10668  036150  023727  000462  000005                                                         CMP     DATTYP,#5
10669  036156  003402                                                                        BLE     $51442
10670  036160                             INLINE <JMP END23>
10671  036160  000137  037026                                                                 JMP END23
10672  036164                           ENDIF
10673  036164                                                                          $51442:
10674
10675                                    ;+
10676                                    ;       RESTORE MSD & LSD OF DS.EXP
10677                                    ;-
10678
10679  036164                           LET DS.EXP :B= DSTMP4     ;MSD
10680  036164  113737  000556  062536                                                         MOVB    DSTMP4,DS.EXP
10681  036172                           LET TEMP4 := #DS.EXP-1 + DATA04
10682  036172  012737  062535  000504                                                         MOV     #DS.EXP-1,TEMP4
10683  036200  063737  000570  000504                                                         ADD     DATA04,TEMP4
10684  036206                           LET @TEMP4 :B= DSTMP5     ;LSD
10685  036206  113777  000557  142270                                                         MOVB    DSTMP5,@TEMP4
10686
10687                                    ;+
10688                                    ;       SIGN DS.EXP BY DATA TYPE
10689                                    ;-
```

```
10690
10691  036214                                  SELECT DATTYP OF 5
10692  036214  013746  000462                                                    MOV     DATTYP,-(SP)
10693  036220  006316                                                            ASL     (SP)
10694  036222  060716                                                            ADD     PC,(SP)
10695  036224  063607                                                            ADD     @(SP)+,PC
10696  036226                                                                $51443:
10697  036226  000012                                                            .WORD   $51451-$51443
10698  036230  000060                                                            .WORD   $51450-$51443
10699  036232  000136                                                            .WORD   $51447-$51443
10700  036234  000214                                                            .WORD   $51446-$51443
10701  036236  000260                                                            .WORD   $51445-$51443
10702  036240                                   CASE 1
10703  036240                                                                $51451:
10704  036240                                    LET DESCR4 := DATA04             ;SIGNED ZONED
10705  036240  013737  000570  000624                                            MOV     DATA04,DESCR4
10706  036246                                   IF DATA04 NE #0 THEN
10707  036246  005737  000570                                                    TST     DATA04
10708  036252  001414                                                            BEQ     $51452
10709  036254                                      IF SIGN2 EQ #0 THEN
10710  036254  005737  000452                                                    TST     SIGN2
10711  036260  001004                                                            BNE     $51453
10712  036262                                       LET @TEMP4 :B= @TEMP4 SET.BY #60
10713  036262  152777  000060  142214                                            BISB    #60,@TEMP4
10714  036270                                      ELSE
10715  036270  000403                                                            BR      $51454
10716  036272                                                                $51453:
10717  036272                                       LET @TEMP4 :B= @TEMP4 SET.BY #160
10718  036272  152777  000160  142204                                            BISB    #160,@TEMP4
10719  036300                                      ENDIF
10720  036300                                                                $51454:
10721  036300                                      LET DS.EXP-1 :B= #0
10722  036300  105037  062535                                                    CLRB    DS.EXP-1
10723  036304                                   ENDIF
10724  036304                                                                $51452:
10725
10726  036304                                   CASE 2
10727  036304  000524                                                            BR      $51444
10728  036306                                                                $51450:
10729  036306                                    LET DESCR4 := DATA04 SET.BY #20000 ;TRAILING OVERPUNCH
10730  036306  013737  000570  000624                                            MOV     DATA04,DESCR4
10731  036314  052737  020000  000624                                            BIS     #20000,DESCR4
10732  036322                                   IF DATA04 NE #0 THEN
10733  036322  005737  000570                                                    TST     DATA04
10734  036326  001415                                                            BEQ     $51455
10735  036330                                      LET R5 :B= DSTMP5
10736  036330  113705  000557                                                    MOVB    DSTMP5,R5
10737  036334                                      LET R5 := R5 - #60
10738  036334  162705  000060                                                    SUB     #60,R5
10739  036340                                      IF SIGN2 EQ #-1 THEN
10740  036340  023727  000452  177777                                            CMP     SIGN2,#-1
10741  036346  001002                                                            BNE     $51456
10742  036350                                       LET R5 := R5 + #10.
10743  036350  062705  000012                                                    ADD     #10.,R5
10744  036354                                      ENDIF
10745  036354                                                                $51456:
```

```
10746  036354
10747  036354  116577  055254  142122                    LET @TEMP4 :B= OVPNCH(R5)                          MOVB    OVPNCH(R5),@TEMP
10748  036362                                            ENDIF
10749  036362                                                                                $51455:
10750
10751  036362                                          CASE 3
10752  036362  000475                                                                       BR      $51444
10753  036364                                                                                $51447:
10754  036364                                           LET DESCR4 := DATA04 SET.BY #30000 ;LEADING OVERPUNCH
10755  036364  013737  000570  000624                                                       MOV     DATA04,DESCR4
10756  036372  052737  030000  000624                                                       BIS     #30000,DESCR4
10757  036400                                            IF DATA04 NE #0 THEN
10758  036400  005737  000570                                                             TST     DATA04
10759  036404  001415                                                                     BEQ     $51457
10760  036406                                              LET R5 :B= DSTMP4
10761  036406  113705  000556                                                           MOVB    DSTMP4,R5
10762  036412                                              LET R5 := R5 - #60
10763  036412  162705  000060                                                           SUB     #60,R5
10764  036416                                              IF SIGN2 EQ #-1 THEN
10765  036416  023727  000452  177777                                                     CMP     SIGN2,#-1
10766  036424  001002                                                                     BNE     $51460
10767  036426                                                LET R5 := R5 + #10.
10768  036426  062705  000012                                                           ADD     #10.,R5
10769  036432                                              ENDIF
10770  036432                                                                            $51460:
10771  036432                                              LET DS.EXP :B= OVPNCH(R5)
10772  036432  116537  055254  062536                                                   MOVB    OVPNCH(R5),DS.EX
10773  036440                                            ENDIF
10774  036440                                                                            $51457:
10775
10776  036440                                          CASE 4
10777  036440  000446                                                                   BR      $51444
10778  036442                                                                            $51446:
10779  036442                                           LET DESCR4 := DATA04 SET.BY #40000 ;TRAILING SEPARATE
10780  036442  013737  000570  000624                                                   MOV     DATA04,DESCR4
10781  036450  052737  040000  000624                                                   BIS     #40000,DESCR4
10782  036456                                              LET R5 := TEMP4 + #1
10783  036456  013705  000504                                                         MOV     TEMP4,R5
10784  036462  005205                                                                 INC     R5
10785  036464                                              IF SIGN2 EQ #0 THEN
10786  036464  005737  000452                                                         TST     SIGN2
10787  036470  001003                                                                 BNE     $51461
10788  036472                                                LET (R5) :B= #53
10789  036472  112715  000053                                                       MOVB    #53,(R5)
10790  036476                                              ELSE
10791  036476  000402                                                               BR      $51462
10792  036500                                                                        $51461:
10793  036500                                                LET (R5) :B= #55
10794  036500  112715  000055                                                       MOVB    #55,(R5)
10795  036504                                              ENDIF
10796  036504                                                                        $51462:
10797
10798  036504                                          CASE 5
10799  036504  000424                                                               BR      $51444
10800  036506                                                                        $51445:
10801  036506                                           LET DESCR4 := DATA04 SET.BY #50000
```

```
10802  036506  013737  000570  000624                                          MOV     DATA04,DESCR4
10803  036514  052737  050000  000624                                          BIS     #50000,DESCR4
10804  036522                          LET R5 := TEMP4 + #1
10805  036522  013705  000504                                                  MOV     TEMP4,R5
10806  036526  005205                                                          INC     R5
10807  036530                          LET (R5) :B= #0
10808  036530  105015                                                          CLRB    (R5)
10809  036532                          IF SIGN2 EQ #0 THEN
10810  036532  005737  000452                                                  TST     SIGN2
10811  036536  001004                                                          BNE     $51463
10812  036540                           LET DS.EXP-1 :B= #53
10813  036540  112737  000053  062535                                          MOVB    #53,DS.EXP-1
10814  036546                          ELSE
10815  036546  000403                                                          BR      $51464
10816  036550                                                          $51463:
10817  036550                           LET DS.EXP-1 :B= #55
10818  036550  112737  000055  062535                                          MOVB    #55,DS.EXP-1
10819  036556                          ENDIF
10820  036556                                                          $51464:
10821  036556                      ENDSELECT
10822  036556                                                          $51444:
10823
10824                               ;+
10825                               ;       CLR DS.DST & LOAD DESCRIPTORS
10826                               ;-
10827
10828  036556                          LET R0 := #DS.DST-1
10829  036556  012700  062473                                                  MOV     #DS.DST-1,R0
10830  036562                          LET R1 := #41
10831  036562  012701  000041                                                  MOV     #41,R1
10832  036566                          INLINE <DOIT:   CLRB    (R0)+>
10833  036566  105020                                                  DOIT:   CLRB    (R0)+
10834  036570                          INLINE <SOB     R1,     DOIT>
10835  036570  077102                                                          SOB     R1,     DOIT
10836  036572                          LET R0 := DESCR0
10837  036572  013700  000614                                                  MOV     DESCR0,R0
10838  036576                          LET R1 := DESCR1
10839  036576  013701  000616                                                  MOV     DESCR1,R1
10840  036602                          LET R2 := DESCR2
10841  036602  013702  000620                                                  MOV     DESCR2,R2
10842  036606                          LET R3 := DESCR3
10843  036606  013703  000622                                                  MOV     DESCR3,R3
10844  036612                          LET R4 := DESCR4
10845  036612  013704  000624                                                  MOV     DESCR4,R4
10846  036616                          LET R5 := DESCR5
10847  036616  013705  000626                                                  MOV     DESCR5,R5
10848  036622                          LET R4.EXP := R4
10849  036622  010437  000532                                                  MOV     R4,R4.EXP
10850  036626                          LET R5.EXP := R5
10851  036626  010537  000534                                                  MOV     R5,R5.EXP
10852  036632                          INLINE <SUBN>
10853  036632  076051                                                          SUBN
10854
10855                               ;+
10856                               ; CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
10857                               ;-
```

```
10858
10859  036634
10860  036634  013737  177776  000516          LET CC := PSW                          MOV     PSW,CC
10861  036642
10862  036642  042737  177760  000516          LET CC := CC CLR.BY #177760            BIC     #177760,CC
10863  036650
10864  036650  023737  000516  000520          IF CC NE CC.EXP THEN                   CMP     CC,CC.EXP
10865  036656  001402                                                                 BEQ     $51465
10866  036660
10867  036660  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10868  036664
10869  036664                                  ENDIF                                $51465:
10870  036664
10871  036664  020037  000522                  IF R0 NE R0.EXP THEN                   CMP     R0,R0.EXP
10872  036670  001402                                                                 BEQ     $51466
10873  036672
10874  036672  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10875  036676
10876  036676                                  ENDIF                                $51466:
10877  036676
10878  036676  020137  000524                  IF R1 NE R1.EXP THEN                   CMP     R1,R1.EXP
10879  036702  001402                                                                 BEQ     $51467
10880  036704
10881  036704  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10882  036710
10883  036710                                  ENDIF                                $51467:
10884  036710
10885  036710  020237  000526                  IF R2 NE R2.EXP THEN                   CMP     R2,R2.EXP
10886  036714  001402                                                                 BEQ     $51470
10887  036716
10888  036716  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10889  036722
10890  036722                                  ENDIF                                $51470:
10891  036722
10892  036722  020337  000530                  IF R3 NE R3.EXP THEN                   CMP     R3,R3.EXP
10893  036726  001402                                                                 BEQ     $51471
10894  036730
10895  036730  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10896  036734
10897  036734                                  ENDIF                                $51471:
10898  036734
10899  036734  020437  000532                  IF R4 NE R4.EXP THEN                   CMP     R4,R4.EXP
10900  036740  001402                                                                 BEQ     $51472
10901  036742
10902  036742  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10903  036746
10904  036746                                  ENDIF                                $51472:
10905  036746
10906  036746  020537  000534                  IF R5 NE R5.EXP THEN                   CMP     R5,R5.EXP
10907  036752  001402                                                                 BEQ     $51473
10908  036754
10909  036754  004737  056274                    CALL ERROR                           JSR     PC,ERROR
10910  036760
10911  036760                                  ENDIF                                $51473:
10912
10913
```

```
10914
10915                                   ;+
10916                                   ;       CHECK RESULTS VS EXPECTED RESULTS
10917                                   ;-
10918  036760                           LET R0 := #DS.DST-1                        MOV     #DS.DST-1,R0
10919  036760  012700  062473
10920  036764                           LET R1 := #DS.EXP-1                        MOV     #DS.EXP-1,R1
10921  036764  012701  062535
10922  036770                           LET ERRFLG := #0                           CLR     ERRFLG
10923  036770  005037  000454
10924  036774                           WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
10925  036774                                                                   $51474:
10926  036774  020027  062534                                                   CMP     R0,#DS.DST+40
10927  037000  001410                                                           BEQ     $51475
10928  037002  005737  000454                                                   TST     ERRFLG
10929  037006  001005                                                           BNE     $51475
10930  037010                            IFB (R0)+ NE (R1)+ THEN
10931  037010  122021                                                           CMPB    (R0)+,(R1)+
10932  037012  001402                                                           BEQ     $51476
10933  037014
10934  037014  004737  056274            CALL ERROR                             JSR     PC,ERROR
10935  037020
10936  037020                            ENDIF                                $51476:
10937  037020
10938  037020  000765                    ENDDO                                  BR      $51474
10939  037022                                                                   $51475:
10940
10941  037022                           ;ENDINC
10942  037022  000137  036144           INLINE <JMP INC23>                         JMP INC23
10943  037026
10944  037026                             INLINE <END23:>                          END23:
10945
10946  037026                           ;ENDINC
10947  037026  000137  035554           INLINE <JMP INC22>                         JMP INC22
10948  037032
10949  037032                             INLINE <END22:>                          END22:
10950
10951  037032                           ;ENDINC
10952  037032  000137  035170           INLINE <JMP INC21>                         JMP INC21
10953  037036
10954  037036                             INLINE <END21:>                          END21:
10955  037036
10956  037036  062737  000022  000542   LET TSTCAS := TSTCAS + #22                 ADD     #22,TSTCAS
10957  037044
10958  037044  005337  000466           LET COUNT := COUNT - #1                    DEC     COUNT
10959
10960  037050                           ;UNTIL COUNT EQ #0
10961  037050  005737  000466           IF COUNT NE #0 THEN                        TST     COUNT
10962  037054  001402                                                             BEQ     $51477
10963  037056
10964  037056  000137  034612             INLINE <JMP $5051>                       JMP $5051
10965  037062
10966  037062                           ENDIF                                  $51477:
10967
10968                                   ;+
10969                                   ;       INLINE CASE - SUBNI, USING UNSIGNED ZONED DATA
```

```
10970                                   ;-
10971
10972  037062                           CALL CLRDSB
10973  037062  004737  055520                                                  JSR     PC,CLRDSB
10974
10975                                   ;+
10976                                   ;       LOAD DSBUF1
10977                                   ;-
10978
10979  037066                           LET R0 := #ADD1+2                      ;SOURCE
10980  037066  012700  063360                                                  MOV     #ADD1+2,R0
10981  037072                           LET R1 := TADDI CLR.BY #10000          ;# OF BYTES TO XFER
10982  037072  013701  064052                                                  MOV     TADDI,R1
10983  037076  042701  010000                                                  BIC     #10000,R1
10984  037102                           LET R2 := #DSBUF1                      ;DESTINATION
10985  037102  012702  062370                                                  MOV     #DSBUF1,R2
10986  037106                           INLINE  <1$:    MOVB    (R0)+,  (R2)+>
10987  037106  112022                                                          1$:     MOVB    (R0)+,
10988  037110                           INLINE  <       SOB     R1,     1$>
10989  037110  077102                                                          SOB     R1,
10990
10991                                   ;+
10992                                   ;       LOAD DSBUF2
10993                                   ;-
10994
10995  037112                           LET R0 := #ADD1A+2
10996  037112  012700  063402                                                  MOV     #ADD1A+2,R0
10997  037116                           LET R1 := TADDI+4 CLR.BY #10000
10998  037116  013701  064056                                                  MOV     TADDI+4,R1
10999  037122  042701  010000                                                  BIC     #10000,R1
11000  037126                           LET R2 := #DSBUF2
11001  037126  012702  062432                                                  MOV     #DSBUF2,R2
11002  037132                           INLINE  <2$:    MOVB    (R0)+,  (R2)+>
11003  037132  112022                                                          2$:     MOVB    (R0)+,
11004  037134                           INLINE  <       SOB     R1,     2$>
11005  037134  077102                                                          SOB     R1,
11006
11007                                   ;+
11008                                   ;       LOAD DS.EXP
11009                                   ;-
11010
11011  037136                           LET R0 := #ADD1C+2
11012  037136  012700  063454                                                  MOV     #ADD1C+2,R0
11013  037142                           LET R1 := TADDI+10 CLR.BY #10000
11014  037142  013701  064062                                                  MOV     TADDI+10,R1
11015  037146  042701  010000                                                  BIC     #10000,R1
11016  037152                           LET R2 := #DS.EXP
11017  037152  012702  062536                                                  MOV     #DS.EXP,R2
11018  037156                           INLINE  <3$:    MOVB    (R0)+,  (R2)>
11019  037156  112012                                                          3$:     MOVB    (R0)+,
11020  037160                           INLINE  <       BISB    #60,    (R2)+>
11021  037160  152722  000060                                                  BISB    #60,
11022  037164                           INLINE  <       SOB     R1,     3$>
11023  037164  077104                                                          SOB     R1,
11024
11025  037166                           CALL CLRREG                            ;ENSURE R0-R5 ARE CLR
```

```
11026  037166  004737  055330                                          JSR     PC,CLRREG
11027
11028  037172                          INLINE <SUBNI>                  SUBNI
11029  037172  076151                  INLINE <.WORD TADDI>            .WORD TADDI
11030  037174
11031  037174  064052                  INLINE <.WORD TADDI+4>          .WORD TADDI+4
11032  037176
11033  037176  064056                  INLINE <.WORD TADDI+10>         .WORD TADDI+10
11034  037200
11035  037200  064062                  LET CC := PSW                   MOV     PSW,CC
11036  037202
11037  037202  013737  177776  000516  LET CC := CC CLR.BY #177760     BIC     #177760,CC
11038  037210
11039  037210  042737  177760  000516  IF CC NE #0 THEN                TST     CC
11040  037216                                                          BEQ     $51500
11041  037216  005737  000516
11042  037222  001402
11043  037224                           CALL ERROR
11044  037224  004737  056274                                          JSR     PC,ERROR
11045  037230                          ENDIF
11046  037230                                                  $51500:
11047
11048                                   ;+
11049                                   ;       ENSURE GPR'S STILL ZERO
11050                                   ;-
11051
11052  037230                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
11053  037230  005700                                                  TST     R0
11054  037232  001004                                                  BNE     $51501
11055  037234  005701                                                  TST     R1
11056  037236  001002                                                  BNE     $51501
11057  037240  005702                                                  TST     R2
11058  037242  001402                                                  BEQ     $51502
11059  037244                                                  $51501:
11060  037244                           CALL ERROR
11061  037244  004737  056274                                          JSR     PC,ERROR
11062  037250                          ENDIF
11063  037250                                                  $51502:
11064  037250
11065  037250  005703                  IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
11066  037252  001004                                                  TST     R3
11067  037254  005704                                                  BNE     $51503
11068  037256  001002                                                  TST     R4
11069  037260  005705                                                  BNE     $51503
11070  037262  001402                                                  TST     R5
11071  037264                                                          BEQ     $51504
11072  037264                           CALL ERROR             $51503:
11073  037264  004737  056274                                          JSR     PC,ERROR
11074  037270                          ENDIF
11075  037270                                                  $51504:
11076
11077                                   ;+
11078                                   ;       CHECK RESULTS
11079                                   ;-
11080
11081  037270                          LET R0 := #DS.DST
```

```
 11082  037270  012700  062474          LET R1 := #DS.EXP                ;EXPECTED DATA
 11083  037274                                                                                    MOV     #DS.DST,R0
 11084  037274  012701  062536                                                                    MOV     #DS.EXP,R1
 11085  037300          LET ERRFLG := #0
 11086  037300  005037  000454                                                                    CLR     ERRFLG
 11087  037304          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
 11088  037304                                                                           $51505:
 11089  037304  020027  062534                                                                    CMP     R0,#DS.DST+40
 11090  037310  001410                                                                            BEQ     $51506
 11091  037312  005737  000454                                                                    TST     ERRFLG
 11092  037316  001005                                                                            BNE     $51506
 11093  037320           IFB (R0)+ NE (R1)+ THEN
 11094  037320  122021                                                                            CMPB    (R0)+,(R1)+
 11095  037322  001402                                                                            BEQ     $51507
 11096  037324            CALL ERROR
 11097  037324  004737  056274                                                                    JSR     PC,ERROR
 11098  037330           ENDIF
 11099  037330                                                                           $51507:
 11100  037330          ENDDO
 11101  037330  000765                                                                            BR      $51505
 11102  037332                                                                           $51506:
 11103
 11104
```

SEQ 0231

```
11105                                   .SBTTL  CMPN
11106                                   ;*****************************************************************
11107                                   ;
11108                                   ;  CMPN TEST
11109                                   ;
11110                                   ;*****************************************************************
11111
11112  037332                           INLINE <XCMPN:>
11113  037332                                                                          XCMPN:
11114  037332                           INLINE <SCOPE>
11115  037332  000004                                                                 SCOPE
11116  037334
11117  037334  012737  000020  000404   LET $TIMES := #20                ;DO 20 ITERATIONS
                                                                                       MOV     #20,$TIMES
11118  037342
11119  037342  013737  062576  000466   LET COUNT := TCMP               ;GET TEST COUNT
                                                                                       MOV     TCMP,COUNT
11120  037350
11121  037350  012737  062600  000542   LET TSTCAS := #TCMP+2           ;POINT TO FIRST TEST CASE
                                                                                       MOV     #TCMP+2,TSTCAS
11122                                   ;REPEAT
11123  037356                           INLINE <$5052:>
11124  037356                                                                          $5052:
11125  037356                              CALL CLRDSB
11126  037356  004737  055520                                                        JSR     PC,CLRDSB
11127  037362
11128  037362  005037  000520             LET CC.EXP := #0
                                                                                       CLR     CC.EXP
11129  037366
11130  037366  005037  000446             LET SIGNO := #0
                                                                                       CLR     SIGNO
11131  037372
11132  037372  005037  000462             LET DATTYP := #0
                                                                                       CLR     DATTYP
11133
11134                                      ;+
11135                                      ; GET SOURCE DESCRIPTORS FROM TABLE
11136                                      ;-
11137
11138  037376
11139  037376  013700  000542   LET R0 := TSTCAS
                                                                                       MOV     TSTCAS,R0
11140  037402
11141  037402  012037  000560   LET DATA00 := (R0)+                ;SRC1 LENGTH
                                                                                       MOV     (R0)+,DATA00
11142  037406
11143  037406  012037  000562   LET DATA01 := (R0)+                ;SRC1 POINTER
                                                                                       MOV     (R0)+,DATA01
11144  037412
11145  037412  012037  000564   LET DATA02 := (R0)+                ;SRC2 LENGTH
                                                                                       MOV     (R0)+,DATA02
11146  037416
11147  037416  011037  000566   LET DATA03 := (R0)                 ;SRC2 POINTER
                                                                                       MOV     (R0),DATA03
11148
11149                                   ;+
11150                                   ; LOAD SRC1 AND SRC2 INTO DSBUF1 AND DSBUF2.
11151                                   ;-
11152
11153  037422
11154  037422  013702  000562   LET R2 := DATA01 + #2                ;GET SRC1 ADDRESS
                                                                                       MOV     DATA01,R2
11155  037426  062702  000002                                                        ADD     #2,R2
11156  037432
11157  037432  012703  062370   LET R3 := #DSBUF1
                                                                                       MOV     #DSBUF1,R3
11158  037436
11159  037436  111237  000552   LET DSTMP0 :B= (R2)                 ;SAVE SRC1 MSD
                                                                                       MOVB    (R2),DSTMP0
11160  037442                           DECR R1 FROM DATA00 TO #1 BY #1
```

```
11161  037442  013701  000560                                                  MOV     DATA00,R1
11162  037446  000401                                                          BR      $51510
11163  037450                                                          $51511:
11164  037450  005301                                                          DEC     R1
11165  037452                                                          $51510:
11166  037452  020127  000001                                                  CMP     R1,#1
11167  037456  002402                                                          BLT     $51512
11168  037460                        LET (R3)+ :B= (R2)+
11169  037460  112223                                                          MOVB    (R2)+,(R3)+
11170  037462                      ENDDEC
11171  037462  000772                                                          BR      $51511
11172  037464                                                          $51512:
11173  037464                      IF DATA00 HI #0 THEN
11174  037464  005737  000560                                                  TST     DATA00
11175  037470  101402                                                          BLOS    $51513
11176  037472
11177  037472  114237  000553        LET DSTMP1 :B= -(R2)          ;SAVE SRC1 LSD
                                                                              MOVB    -(R2),DSTMP1
11178  037476                      ENDIF
11179  037476                                                          $51513:
11180  037476                      LET R2 := DATA03 + #2           ;GET SRC2 ADDRESS
11181  037476  013702  000566                                                  MOV     DATA03,R2
11182  037502  062702  000002                                                  ADD     #2,R2
11183  037506                      LET R3 := #DSBUF2
11184  037506  012703  062432                                                  MOV     #DSBUF2,R3
11185  037512                      LET DSTMP2 :B= (R2)             ;SAVE SRC2 MSD
11186  037512  111237  000554                                                  MOVB    (R2),DSTMP2
11187  037516                      DECR R1 FROM DATA02 TO #1 BY #1
11188  037516  013701  000564                                                  MOV     DATA02,R1
11189  037522  000401                                                          BR      $51514
11190  037524                                                          $51515:
11191  037524  005301                                                          DEC     R1
11192  037526                                                          $51514:
11193  037526  020127  000001                                                  CMP     R1,#1
11194  037532  002402                                                          BLT     $51516
11195  037534                        LET (R3)+ :B= (R2)+
11196  037534  112223                                                          MOVB    (R2)+,(R3)+
11197  037536                      ENDDEC
11198  037536  000772                                                          BR      $51515
11199  037540                                                          $51516:
11200  037540                      LET DSTMP3 :B= -(R2)              ;SAVE SRC2 LSD
11201  037540  114237  000555                                                  MOVB    -(R2),DSTMP3
11202
11203                               ;+
11204                               ; COMPARE SRC1 AND SRC2, AND SET N AND Z BITS
11205                               ; IN CC.EXP ACCORDINGLY.
11206                               ;-
11207
11208  037544                      IF DATA00 EQ #0 AND DATA02 EQ #0 THEN       ;SRC1 LENGTH AND SRC2 LENGTH = 0
11209  037544  005737  000560                                                  TST     DATA00
11210  037550  001007                                                          BNE     $51517
11211  037552  005737  000564                                                  TST     DATA02
11212  037556  001004                                                          BNE     $51517
11213  037560                        LET CC.EXP := CC.EXP SET.BY #ZBIT
11214  037560  052737  000004  000520                                          BIS     #ZBIT,CC.EXP
11215  037566                      ELSE
11216  037566  000424                                                          BR      $51520
```

```
11217  037570                                                                                $51517:
11218  037570                                 IF DATA00 EQ #0 AND @DATA03 EQ #0 THEN  ;SRC1 LENGTH = 0 AND SRC2 SIGN IS +
11219  037570  005737  000560                                                                TST     DATA00
11220  037574  001007                                                                        BNE     $51521
11221  037576  005777  140764                                                                TST     @DATA03
11222  037602  001004                                                                        BNE     $51521
11223  037604                                     LET CC.EXP := CC.EXP SET.BY #NBIT
11224  037604  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
11225  037612                                 ELSE
11226  037612  000412                                                                        BR      $51522
11227  037614                                                                              $51521:
11228  037614                                     IF DATA02 EQ #0 AND @DATA01 EQ #-1 THEN    ;SRC2 LENGTH = 0 & SRC1 SIGN IS -
11229  037614  005737  000564                                                                TST     DATA02
11230  037620  001007                                                                        BNE     $51523
11231  037622  027727  140734  177777                                                        CMP     @DATA01,#-1
11232  037630  001003                                                                        BNE     $51523
11233  037632                                         LET CC.EXP := CC.EXP SET.BY #NBIT
11234  037632  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
11235  037640                                     ENDIF
11236  037640                                                                              $51523:
11237  037640                                 ENDIF
11238  037640                                                                              $51522:
11239  037640                             ENDIF
11240  037640                                                                              $51520:
11241  037640                             IF DATA00 NE #0 AND DATA02 NE #0 THEN       ;SRC1 LENGTH AND SRC2 LENGTH > 0
11242  037640  005737  000560                                                                TST     DATA00
11243  037644  001520                                                                        BEQ     $51524
11244  037646  005737  000564                                                                TST     DATA02
11245  037652  001515                                                                        BEQ     $51524
11246  037654                             IF @DATA01 NE @DATA03 THEN                  ;SRC1 SIGN AND SRC2 SIGN ARE DIFFERENT
11247  037654  027777  140702  140704                                                        CMP     @DATA01,@DATA03
11248  037662  001410                                                                        BEQ     $51525
11249  037664                               IF @DATA01 EQ #-1 THEN                    ;SRC1 SIGN IS -
11250  037664  027727  140672  177777                                                        CMP     @DATA01,#-1
11251  037672  001003                                                                        BNE     $51526
11252  037674                                   LET CC.EXP := CC.EXP SET.BY #NBIT
11253  037674  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
11254  037702                               ENDIF
11255  037702                                                                            $51526:
11256  037702                             ELSE                              ;SRC1 SIGN AND SRC2 SIGN ARE EQUAL
11257  037702  000501                                                                        BR      $51527
11258  037704                                                                            $51525:
11259  037704                               LET SIGN0 := @DATA01                        ;SAVE THE COMMON SIGN
11260  037704  017737  140652  000446                                                        MOV     @DATA01,SIGN0
11261  037712                               IF DATA00 LO DATA02 AND SIGN0 EQ #0 THEN  ;SRC1 LENGTH < SRC2 LENGTH AND SIGNS
11262  037712  023737  000560  000564                                                        CMP     DATA00,DATA02
11263  037720  103007                                                                        BHIS    $51530
11264  037722  005737  000446                                                                TST     SIGN0
11265  037726  001004                                                                        BNE     $51530
11266  037730                                   LET CC.EXP := CC.EXP SET.BY #NBIT
11267  037730  052737  000010  000520                                                        BIS     #NBIT,CC.EXP
11268  037736                               ELSE
11269  037736  000413                                                                        BR      $51531
11270  037740                                                                            $51530:
11271  037740                                   IF DATA00 HI DATA02 AND SIGN0 EQ #-1 THEN  ;SRC1 LENGTH > SRC2 LENGTH AND
11272  037740  023737  000560  000564                                                        CMP     DATA00,DATA02
```

```
11273  037746  101407                                                                    BLOS    $51532
11274  037750  023727  000446  177777                                                    CMP     SIGNO,#-1
11275  037756  001003                                                                    BNE     $51532
11276  037760                                  LET CC.EXP := CC.EXP SET.BY #NBIT
11277  037760  052737  000010  000520                                                    BIS     #NBIT,CC.EXP
11278  037766                              ENDIF
11279  037766                                                                  $51532:
11280  037766                          ENDIF
11281  037766                                                                  $51531:
11282  037766                          IF DATA00 EQ DATA02 THEN                ;SRC1 LENGTH AND SRC2 LENGTH ARE EQUAL
11283  037766  023737  000560  000564                                                    CMP     DATA00,DATA02
11284  037774  001044                                                                    BNE     $51533
11285
11286                                   ;+
11287                                   ; COMPARE SRC1 AND SRC2 BYTE BY BYTE
11288                                   ;-
11289
11290  037776                           LET R0 := DATA00                       ;SRC BUFFER LENGTH
11291  037776  013700  000560                                                            MOV     DATA00,R0
11292  040002                           LET R1 := #DSBUF1              ;SRC1 BUFFER
11293  040002  012701  062370                                                            MOV     #DSBUF1,R1
11294  040006                           LET R2 := #DSBUF2              ;SRC2 BUFFER
11295  040006  012702  062432                                                            MOV     #DSBUF2,R2
11296  040012                           WHILEB R0 NE #0 AND (R1)+ EQ (R2)+ DO
11297  040012                                                                  $51534:
11298  040012  105700                                                                    TSTB    R0
11299  040014  001404                                                                    BEQ     $51535
11300  040016  022122                                                                    CMP     (R1)+,(R2)+
11301  040020  001002                                                                    BNE     $51535
11302  040022                              LET R0 := R0 - #1                   ;DECREMENT COUNTER
11303  040022  005300                                                                    DEC     R0
11304  040024                           ENDDO
11305  040024  000772                                                                    BR      $51534
11306  040026                                                                  $51535:
11307  040026                           IFB -(R1) NE -(R2) THEN     ;SOURCES WERE NOT =
11308  040026  124142                                                                    CMPB    -(R1),-(R2)
11309  040030  001423                                                                    BEQ     $51536
11310  040032                              IFB (R1) LO (R2) AND SIGN0 EQ #0 THEN
11311  040032  121112                                                                    CMPB    (R1),(R2)
11312  040034  103007                                                                    BHIS    $51537
11313  040036  005737  000446                                                           TST     SIGN0
11314  040042  001004                                                                    BNE     $51537
11315  040044                                  LET CC.EXP := CC.EXP SET.BY #NBIT
11316  040044  052737  000010  000520                                                    BIS     #NBIT,CC.EXP
11317  040052                              ELSE
11318  040052  000411                                                                    BR      $51540
11319  040054                                                                  $51537:
11320  040054                                  IFB (R1) HI (R2) AND SIGN0 EQ #-1 THEN
11321  040054  121112                                                                    CMPB    (R1),(R2)
11322  040056  101407                                                                    BLOS    $51541
11323  040060  023727  000446  177777                                                    CMP     SIGN0,#-1
11324  040066  001003                                                                    BNE     $51541
11325  040070                                      LET CC.EXP := CC.EXP SET.BY #NBIT
11326  040070  052737  000010  000520                                                    BIS     #NBIT,CC.EXP
11327  040076                                  ENDIF
11328  040076                                                                  $51541:
```

```
11329  040076                                        ENDIF
11330  040076                                                                          $51540:
11331  040076                                     ELSE                          ;SOURCES WERE EQUAL
11332  040076  000403                                                                        BR      $51542
11333  040100                                                                          $51536:
11334  040100                                        LET CC.EXP := CC.EXP SET.BY #ZBIT
11335  040100  052737  000004  000520                                                        BIS     #ZBIT,CC.EXP
11336  040106                                     ENDIF
11337  040106                                                                          $51542:
11338  040106                                  ENDIF
11339  040106                                                                          $51533:
11340  040106                               ENDIF
11341  040106                                                                          $51527:
11342  040106                            ENDIF
11343  040106                                                                          $51524:
11344
11345                                     ;+
11346                                     ; PERFORM THE CMPN INSTRUCTION WITH ALL COMBINATIONS
11347                                     ; OF SIGNED ZONE, TRAILING AND LEADING OVERPUNCH, AND
11348                                     ; TRAILING AND LEADING SEPARATE (UNSIGNED ZONE WILL
11349                                     ; BE TESTED IN THE INLINE PORTION OF THE TEST).
11350                                     ; CHECK THE RESULTS AND REPORT ERRORS. 'DATTYP'
11351                                     ; WILL CONTAIN SRC1 DATA TYPE AND 'TEMP1' WILL
11352                                     ; CONTAIN SRC2 DATA TYPE CURRENTLY BEING TESTED.
11353                                     ;-
11354
11355                                      ;REPEAT                                ;SRC1 LOOP
11356  040106                             INLINE  <$5201:>
11357  040106                                                                          $5201:
11358  040106                                  IF DATTYP EQ #10000 THEN           ;SKIP UNSIGNED ZONED
11359  040106  023727  000462  010000                                                        CMP     DATTYP,#10000
11360  040114  001003                                                                       BNE     $51543
11361  040116                                     LET DATTYP := DATTYP + #10000
11362  040116  062737  010000  000462                                                        ADD     #10000,DATTYP
11363  040124                                  ENDIF
11364  040124                                                                          $51543:
11365
11366  040124                                  ;RESTORE THE MSD AND LSD OF SRC1
11367  040124  113737  000552  062370          LET DSBUF1 :B= DSTMP0              ;SRC1 MSD
11368  040132                                                                                MOVB    DSTMP0,DSBUF1
11369  040132  012700  062367                  LET R0 := #DSBUF1-1 + DATA00
11370  040136  063700  000560                                                               MOV     #DSBUF1-1,R0
11371  040142                                                                                ADD     DATA00,R0
11372  040142  113710  000553                  LET (R0) :B= DSTMP1                ;SRC1 LSD
11373                                                                                        MOVB    DSTMP1,(R0)
11374  040146                                  ;PUT THE PROPER SIGN INTO SRC1, ACCORDING TO DATTYP.
11375  040146  005737  000462                  IF DATTYP EQ #0 THEN                    ;*** SIGNED ZONED ***
11376  040152  001017                                                                       TST     DATTYP
11377  040154                                                                                BNE     $51544
11378  040154  012700  062367                     LET R0 := #DSBUF1-1 + DATA00
11379  040160  063700  000560                                                               MOV     #DSBUF1-1,R0
11380  040164                                                                                ADD     DATA00,R0
11381  040164  005777  140372                     IF @DATA01 EQ #0 THEN           ;SIGN IS +
11382  040170  001003                                                                       TST     @DATA01
11383  040172                                                                                BNE     $51545
11384  040172  152710  000060                        LET (R0) :B= (R0) SET.BY #60
                                                                                          BISB    #60,(R0)
```

```
11385  040176                                                                                                    ELSE                                ;SIGN IS -
11386  040176  000402                                                                                                                                                BR      $51546
11387  040200                                                                                                                                                $51545:
11388  040200                                                                                                       LET (R0) :B= (R0) SET.BY #160
11389  040200  152710  000160                                                                                                                                      BISB    #160,(R0)
11390  040204                                                                                                    ENDIF
11391  040204                                                                                                                                                $51546:
11392  040204                                                                                                    LET R0 := #DSBUF1-1
11393  040204  012700  062367                                                                                                                                    MOV     #DSBUF1-1,R0
11394  040210                                                                                                    LET (R0) :B= #0                     ;RESTORE AFTER LEADING SEPARATE
11395  040210  105010                                                                                                                                            CLRB    (R0)
11396  040212                                                                                                 ENDIF
11397  040212                                                                                                                                                $51544:
11398  040212                                                                                                 IF DATTYP EQ #20000 THEN                        ;*** TRAILING OVERPUNCH ***
11399  040212  023727  000462  020000                                                                                                                            CMP     DATTYP,#20000
11400  040220  001021                                                                                                                                            BNE     $51547
11401  040222                                                                                                  IF DATA00 HI #0 THEN
11402  040222  005737  000560                                                                                                                                    TST     DATA00
11403  040226  101416                                                                                                                                            BLOS    $51550
11404  040230                                                                                                    LET R0 := #DSBUF1-1 + DATA00
11405  040230  012700  062367                                                                                                                                    MOV     #DSBUF1-1,R0
11406  040234  063700  000560                                                                                                                                    ADD     DATA00,R0
11407  040240                                                                                                    IF @DATA01 EQ #0 THEN             ;SIGN IS +
11408  040240  005777  140316                                                                                                                                    TST     @DATA01
11409  040244  001002                                                                                                                                            BNE     $51551
11410  040246                                                                                                       LET R1 := #0
11411  040246  005001                                                                                                                                            CLR     R1
11412  040250                                                                                                    ELSE                              ;SIGN IS -
11413  040250  000402                                                                                                                                            BR      $51552
11414  040252                                                                                                                                                $51551:
11415  040252                                                                                                       LET R1 := #10.
11416  040252  012701  000012                                                                                                                                    MOV     #10.,R1
11417  040256                                                                                                    ENDIF
11418  040256                                                                                                                                                $51552:
11419  040256                                                                                                    LET R1 :B= R1 SET.BY (R0)         ;FORM TABLE OFFSET
11420  040256  151001                                                                                                                                            BISB    (R0),R1
11421  040260                                                                                                    LET (R0) :B= OVPNCH(R1)           ;PUT IN SIGN/DIGIT
11422  040260  116110  055254                                                                                                                                    MOVB    OVPNCH(R1),(R0)
11423  040264                                                                                                  ENDIF
11424  040264                                                                                                                                                $51550:
11425  040264                                                                                                 ENDIF
11426  040264                                                                                                                                                $51547:
11427  040264                                                                                                 IF DATTYP EQ #30000 THEN                        ;*** LEADING OVERPUNCH ***
11428  040264  023727  000462  030000                                                                                                                            CMP     DATTYP,#30000
11429  040272  001017                                                                                                                                            BNE     $51553
11430  040274                                                                                                    IF DATA00 HI #0 THEN
11431  040274  005737  000560                                                                                                                                    TST     DATA00
11432  040300  101414                                                                                                                                            BLOS    $51554
11433  040302                                                                                                      LET R0 := #DSBUF1
11434  040302  012700  062370                                                                                                                                    MOV     #DSBUF1,R0
11435  040306                                                                                                      IF @DATA01 EQ #0 THEN           ;SIGN IS +
11436  040306  005777  140250                                                                                                                                    TST     @DATA01
11437  040312  001002                                                                                                                                            BNE     $51555
11438  040314                                                                                                        LET R1 := #0
11439  040314  005001                                                                                                                                            CLR     R1
11440  040316                                                                                                      ELSE                              ;SIGN IS -
```

```
11441  040316  000402                                                                    BR      $51556
11442  040320                                                                          $51555:
11443  040320                          LET R1 := #10.
11444  040320  012701  000012                                                          MOV     #10.,R1
11445  040324                        ENDIF
11446  040324                                                                          $51556:
11447  040324                        LET R1 :B= R1 SET.BY (R0)  ;FORM TABLE OFFSET
11448  040324  151001                                                                  BISB    (R0),R1
11449  040326                        LET (R0) :B= OVPNCH(R1)    ;PUT IN SIGN/DIGIT
11450  040326  116110  055254                                                         MOVB    OVPNCH(R1),(R0)
11451  040332                      ENDIF
11452  040332                                                                          $51554:
11453  040332                    ENDIF
11454  040332                                                                          $51553:
11455  040332                    IF DATTYP EQ #40000 THEN              ;*** TRAILING SEPARATE ***
11456  040332  023727  000462  040000                                                 CMP     DATTYP,#40000
11457  040340  001014                                                                 BNE     $51557
11458  040342                      LET R0 := #DSBUF1 + DATA00
11459  040342  012700  062370                                                        MOV     #DSBUF1,R0
11460  040346  063700  000560                                                        ADD     DATA00,R0
11461  040352                      IF @DATA01 EQ #0 THEN               ;SIGN IS +
11462  040352  005777  140204                                                        TST     @DATA01
11463  040356  001003                                                                BNE     $51560
11464  040360                        LET (R0) :B= #53
11465  040360  112710  000053                                                        MOVB    #53,(R0)
11466  040364                      ELSE                                ;SIGN IS -
11467  040364  000402                                                                BR      $51561
11468  040366                                                                      $51560:
11469  040366                        LET (R0) :B= #55
11470  040366  112710  000055                                                        MOVB    #55,(R0)
11471  040372                      ENDIF
11472  040372                                                                      $51561:
11473  040372                    ENDIF
11474  040372                                                                      $51557:
11475  040372                    IF DATTYP EQ #50000 THEN            ;*** LEADING SEPARATE ***
11476  040372  023727  000462  050000                                                 CMP     DATTYP,#50000
11477  040400  001017                                                                 BNE     $51562
11478  040402                      LET R0 := #DSBUF1-1
11479  040402  012700  062367                                                        MOV     #DSBUF1-1,R0
11480  040406                      IF @DATA01 EQ #0 THEN               ;SIGN IS +
11481  040406  005777  140150                                                        TST     @DATA01
11482  040412  001003                                                                BNE     $51563
11483  040414                        LET (R0) :B= #53
11484  040414  112710  000053                                                        MOVB    #53,(R0)
11485  040420                      ELSE                                ;SIGN IS -
11486  040420  000402                                                                BR      $51564
11487  040422                                                                      $51563:
11488  040422                        LET (R0) :B= #55
11489  040422  112710  000055                                                        MOVB    #55,(R0)
11490  040426                      ENDIF
11491  040426                                                                      $51564:
11492  040426
11493  040426  012700  062370                                                        MOV     #DSBUF1,R0
11494  040432  063700  000560                                                        ADD     DATA00,R0
11495  040436                      LET (R0) :B= #0                     ;RESTORE AFTER TRAILING SEPARATE
11496  040436  105010                                                                CLRB    (R0)
```

```
11497  040440                                  ENDIF
11498  040440                                                                  $51562:
11499  040440                                  LET TEMP1 := #0                 ;CLEAR SRC2 DATA TYPE
11500  040440  005037  000476                                                  CLR     TEMP1
11501                                          ;REPEAT                         ;SRC2 LOOP
11502  040444                                  INLINE  <$5202:>
11503  040444                                                                  $5202:
11504  040444                                      IF TEMP1 EQ #10000 THEN     ;SKIP UNSIGNED ZONED
11505  040444  023727  000476  010000                                          CMP     TEMP1,#10000
11506  040452  001003                                                         BNE     $51565
11507  040454                                         LET TEMP1 := TEMP1 + #10000
11508  040454  062737  010000  000476                                         ADD     #10000,TEMP1
11509  040462                                      ENDIF
11510  040462                                                                  $51565:
11511                                              ;RESTORE THE MSD AND LSD OF SRC2
11512  040462                                      LET DSBUF2 :B= DSTMP2               ;SRC2 MSD
11513  040462  113737  000554  062432                                          MOVB    DSTMP2,DSBUF2
11514  040470                                      LET R0 := #DSBUF2-1 + DATA02
11515  040470  012700  062431                                                 MOV     #DSBUF2-1,R0
11516  040474  063700  000564                                                 ADD     DATA02,R0
11517  040500                                      LET (R0) :B= DSTMP3                 ;SRC2 LSD
11518  040500  113710  000555                                                 MOVB    DSTMP3,(R0)
11519                                              ;PUT THE PROPER SIGN INTO SRC2, ACCORDING TO TEMP1
11520  040504                                      IF TEMP1 EQ #0 THEN                 ;*** SIGNED ZONED ***
11521  040504  005737  000476                                                 TST     TEMP1
11522  040510  001017                                                         BNE     $51566
11523  040512                                         LET R0 := #DSBUF2-1 + DATA02
11524  040512  012700  062431                                                 MOV     #DSBUF2-1,R0
11525  040516  063700  000564                                                 ADD     DATA02,R0
11526  040522                                      IF @DATA03 EQ #0 THEN               ;SIGN IS +
11527  040522  005777  140040                                                 TST     @DATA03
11528  040526  001003                                                         BNE     $51567
11529  040530                                         LET (R0) :B= (R0) SET.BY #60
11530  040530  152710  000060                                                 BISB    #60,(R0)
11531  040534                                      ELSE                            ;SIGN IS -
11532  040534  000402                                                         BR      $51570
11533  040536                                                                  $51567:
11534  040536                                         LET (R0) :B= (R0) SET.BY #160
11535  040536  152710  000160                                                 BISB    #160,(R0)
11536  040542                                      ENDIF
11537  040542                                                                  $51570:
11538  040542                                      LET R0 :- #DSBUF2-1
11539  040542  012700  062431                                                 MOV     #DSBUF2-1,R0
11540  040546                                      LET (R0) :B- #0             ;RESTORE AFTER LEADING SEPARATE
11541  040546  105010                                                         CLRB    (R0)
11542  040550                                  ENDIF
11543  040550                                                                  $51566:
11544  040550                                  IF TEMP1 EQ #20000 THEN         ;*** TRAILING OVERPUNCH ***
11545  040550  023727  000476  020000                                          CMP     TEMP1,#20000
11546  040556  001016                                                         BNE     $51571
11547  040560                                      LET R0 := #DSBUF2-1 + DATA02
11548  040560  012700  062431                                                 MOV     #DSBUF2-1,R0
11549  040564  063700  000564                                                 ADD     DATA02,R0
11550  040570                                      IF @DATA03 EQ #0 THEN           ;SIGN IS +
11551  040570  005777  137772                                                 TST     @DATA03
11552  040574  001002                                                         BNE     $51572
```

```
11553  040576
11554  040576  005001                        LET R1 := #0
11555  040600
11556  040600  000402                    ELSE                                ;SIGN IS -
11557  040602                                                                        BR      $51573
11558  040602                                                                $51572:
11559  040602  012701  000012                LET R1 := #10.                        MOV     #10.,R1
11560  040606                                ENDIF
11561  040606                                                                $51573:
11562  040606                                LET R1 :B= R1 SET.BY (R0)       ;FORM TABLE OFFSET
11563  040606  151001                                                               BISB    (R0),R1
11564  040610                                LET (R0) :B= OVPNCH(R1)         ;PUT IN SIGN/DIGIT
11565  040610  116110  055254                                                      MOVB    OVPNCH(R1),(R0)
11566  040614                            ENDIF
11567  040614                                                                $51571:
11568  040614                            IF TEMP1 EQ #30000 THEN             ;*** LEADING OVERPUNCH ***
11569  040614  023727  000476  030000                                               CMP     TEMP1,#30000
11570  040622  001014                                                               BNE     $51574
11571  040624                                LET R0 := #DSBUF2                      MOV     #DSBUF2,R0
11572  040624  012700  062432
11573  040630                                IF @DATA03 EQ #0 THEN           ;SIGN IS +
11574  040630  005777  137732                                                      TST     @DATA03
11575  040634  001002                                                               BNE     $51575
11576  040636                                   LET R1 := #0                       CLR     R1
11577  040636  005001                                                       ;SIGN IS -
11578  040640                                ELSE                                   BR      $51576
11579  040640  000402                                                        $51575:
11580  040642                                                                       MOV     #10.,R1
11581  040642                                   LET R1 := #10.
11582  040642  012701  000012                ENDIF                                $51576:
11583  040646                                LET R1 :B= R1 SET.BY (R0)       ;FORM TABLE OFFSET
11584  040646                                                                       BISB    (R0),R1
11585  040646                                LET (R0) :B= OVPNCH(R1)         ;PUT IN SIGN/DIGIT
11586  040646  151001                                                               MOVB    OVPNCH(R1),(R0)
11587  040650                            ENDIF
11588  040650  116110  055254                                                $51574:
11589  040654                            IF TEMP1 EQ #40000 THEN             ;*** TRAILING SEPARATE ***
11590  040654                                                                       CMP     TEMP1,#40000
11591  040654                                                                       BNE     $51577
11592  040654  023727  000476  040000        LET R0 := #DSBUF2 + DATA02             MOV     #DSBUF2,R0
11593  040662  001014                                                               ADD     DATA02,R0
11594  040664                                IF @DATA03 EQ #0 THEN           ;SIGN IS +
11595  040664  012700  062432                                                      TST     @DATA03
11596  040670  063700  000564                                                      BNE     $51600
11597  040674                                   LET (R0) :B= #53                    MOVB    #53,(R0)
11598  040674  005777  137666                ELSE                            ;SIGN IS -
11599  040700  001003                                                               BR      $51601
11600  040702                                   LET (R0) :B= #55                 $51600:
11601  040702  112710  000053                ENDIF                                MOVB    #55,(R0)
11602  040706                                                                $51601:
11603  040706  000402
11604  040710
11605  040710
11606  040710  112710  000055
11607  040714
11608  040714
```

```
11609  040714                                    ENDIF                                                  $51577:
11610  040714                                    IF TEMP1 EQ #50000 THEN                ;*** LEADING SEPARATE ***
11611  040714                                                                                            CMP     TEMP1,#50000
11612  040714  023727  000476  050000                                                                    BNE     $51602
11613  040722  001017
11614  040724                                        LET R0 := #DSBUF2-1                                 MOV     #DSBUF2-1,R0
11615  040724  012700  062431
11616  040730                                        IF @DATA03 EQ #0 THEN              ;SIGN IS +
11617  040730  005777  137632                                                                            TST     @DATA03
11618  040734  001003                                                                                    BNE     $51603
11619  040736
11620  040736  112710  000053                           LET (R0) :B= #53                                 MOVB    #53,(R0)
11621  040742
11622  040742  000402                                    ELSE                               ;SIGN IS -
11623  040744                                                                                            BR      $51604
11624  040744                                                                                   $51603:
11625  040744  112710  000055                           LET (R0) :B= #55                                 MOVB    #55,(R0)
11626  040750
11627  040750                                        ENDIF                                               $51604:
11628  040750
11629  040750  012700  062432                       LET R0 := #DSBUF2 + DATA02                           MOV     #DSBUF2,R0
11630  040754  063700  000564                                                                            ADD     DATA02,R0
11631  040760
11632  040760  105010                               LET (R0) :B= #0          ;RESTORE AFTER TRAILING SEPARATE
11633  040762                                                                                            CLRB    (R0)
11634  040762                                    ENDIF                                                  $51602:
11635
11636                                            ;+
11637                                            ; LOAD THE GPR'S AND DO THE CMPN INSTRUCTION
11638                                            ;-
11639
11640  040762                                    LET R0 := DATTYP SET.BY DATA00         ;SRC1.DSCR
11641  040762  013700  000462                                                                            MOV     DATTYP,R0
11642  040766  053700  000560                                                                            BIS     DATA00,R0
11643  040772
11644  040772  012701  062370                   LET R1 := #DSBUF1                      ;  ''
11645  040776                                                                                            MOV     #DSBUF1,R1
11646  040776  013702  000476                   LET R2 := TEMP1 SET.BY DATA02          ;SRC2.DSCR
11647  041002  053702  000564                                                                            MOV     TEMP1,R2
11648  041006                                                                                            BIS     DATA02,R2
11649  041006  012703  062432                   LET R3 := #DSBUF2                      ;  ''
11650  041012
11651  041012  005004                           LET R4 := #0                                             MOV     #DSBUF2,R3
11652  041014
11653  041014  005005                           LET R5 := #0                                             CLR     R4
11654  041016
11655  041016  076052                           INLINE <CMPN>                                            CLR     R5
11656                                                                                                     CMPN
11657                                            ;+
11658                                            ; CHECK THE RESULTS
11659                                            ;-
11660
11661  041020                                    LET CC := PSW
11662  041020  013737  177776  000516                                                                    MOV     PSW,CC
11663  041026                                    LET CC := CC CLR.BY #177760
11664  041026  042737  177760  000516                                                                    BIC     #177760,CC
```

```
11665  041034
11666  041034  023737  000516  000520          IF CC NE CC.EXP THEN                    CMP     CC,CC.EXP
11667  041042  001402                                                                  BEQ     $51605
11668  041044
11669  041044  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11670  041050                                      ENDIF
11671  041050                                                                  $51605:
11672  041050                                      IF R0 NE #0 THEN
11673  041050  005700                                                                  TST     R0
11674  041052  001402                                                                  BEQ     $51606
11675  041054
11676  041054  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11677  041060                                      ENDIF
11678  041060                                                                  $51606:
11679  041060                                      IF R1 NE #0 THEN
11680  041060  005701                                                                  TST     R1
11681  041062  001402                                                                  BEQ     $51607
11682  041064
11683  041064  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11684  041070                                      ENDIF
11685  041070                                                                  $51607:
11686  041070                                      IF R2 NE #0 THEN
11687  041070  005702                                                                  TST     R2
11688  041072  001402                                                                  BEQ     $51610
11689  041074
11690  041074  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11691  041100                                      ENDIF
11692  041100                                                                  $51610:
11693  041100                                      IF R3 NE #0 THEN
11694  041100  005703                                                                  TST     R3
11695  041102  001402                                                                  BEQ     $51611
11696  041104
11697  041104  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11698  041110                                      ENDIF
11699  041110                                                                  $51611:
11700  041110                                      IF R4 NE #0 THEN
11701  041110  005704                                                                  TST     R4
11702  041112  001402                                                                  BEQ     $51612
11703  041114
11704  041114  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11705  041120                                      ENDIF
11706  041120                                                                  $51612:
11707  041120                                      IF R5 NE #0 THEN
11708  041120  005705                                                                  TST     R5
11709  041122  001402                                                                  BEQ     $51613
11710  041124
11711  041124  004737  056274                      CALL ERROR                          JSR     PC,ERROR
11712  041130                                      ENDIF
11713  041130                                                                  $51613:
11714  041130                                      LET TEMP1 := TEMP1 + #10000         ;UPDATE SRC2 TO NEXT DATA TYPE
11715  041130  062737  010000  000476                                                 ADD     #10000,TEMP1
11716                                          ;UNTIL TEMP1 EQ #60000
11717  041136                                  IF TEMP1 NE #60000 THEN
11718  041136  023727  000476  060000                                                 CMP     TEMP1,#60000
11719  041144  001402                                                                  BEQ     $51614
11720  041146                                    INLINE  <JMP  $5202>
```

```
11721  041146  000137  040444                    ENDIF                                                    JMP  $5202
11722  041152
11723  041152
11724  041152
11725  041152  062737  010000  000462          LET DATTYP := DATTYP + #10000                    $51614:
11726                                          ;UNTIL DATTYP EQ #60000                  ;UPDATE SRC1 TO NEXT DATA TYPE
11727  041160                                  IF DATTYP NE #60000 THEN                         ADD     #10000,DATTYP
11728  041160  023727  000462  060000
11729  041166  001402                            INLINE  <JMP  $5201>                          CMP     DATTYP,#60000
11730  041170                                                                                   BEQ     $51615
11731  041170  000137  040106                   ENDIF                                         JMP  $5201
11732  041174
11733  041174                                  LET TSTCAS := TSTCAS + #10                $51615:
11734
11735  041174                                  LET COUNT := COUNT - #1                          ADD     #10,TSTCAS
11736  041174  062737  000010  000542
11737  041202                                 ;UNTIL COUNT EQ #0 THEN                           DEC     COUNT
11738  041202  005337  000466                 IF COUNT NE #0 THEN
11739                                                                                           TST     COUNT
11740  041206                                                                                   BEQ     $51616
11741  041206  005737  000466                   INLINE <JMP $5052>                            JMP $5052
11742  041212  001402
11743  041214                                  ENDIF                                     $51616:
11744  041214  000137  037356
11745  041220
11746  041220
11747
11748
11749                                          ;+
11750                                          ; DO ONE INLINE CASE - CMPNI.  USE UNSIGNED ZONED DATA TYPE.
11751                                          ;-
11752
11753  041220                                  LET R0 := #-1                                    MOV     #-1,R0
11754  041220  012700  177777                 LET R1 := #-1                                    MOV     #-1,R1
11755  041224
11756  041224  012701  177777                 LET R2 := #-1                                    MOV     #-1,R2
11757  041230
11758  041230  012702  177777                 LET R3 := #-1                                    MOV     #-1,R3
11759  041234
11760  041234  012703  177777                 LET R4 := #-1                                    MOV     #-1,R4
11761  041240
11762  041240  012704  177777                 LET R5 := #-1                                    MOV     #-1,R5
11763  041244
11764  041244  012705  177777                 INLINE   <CMPNI>                                 CMPNI
11765  041250
11766  041250  076152                         INLINE   <.WORD   TCMPNI>                        .WORD   TCMPNI
11767  041252
11768  041252  041366                         INLINE   <.WORD   TCMPNI+4>                      .WORD   TCMPNI+4
11769  041254
11770  041254  041372                         LET CC := PSW                                    MOV     PSW,CC
11771  041256
11772  041256  013737  177776  000516         LET CC := CC CLR.BY #177760                      BIC     #177760,CC
11773  041264
11774  041264  042737  177760  000516         IF CC NE #4 THEN                                 CMP     CC,#4
11775  041272
11776  041272  023727  000516  000004
```

```
11777  041300  001402                          CALL ERROR                                              BEQ     $51617
11778  041302                                                                                          JSR     PC,ERROR
11779  041302  004737  056274                  ENDIF
11780  041306                                                                                  $51617:
11781  041306                                  IF R0 NE #-1 OR R1 NE #-1 OR R2 NE #-1 THEN             CMP     R0,#-1
11782  041306                                                                                          BNE     $51620
11783  041306  020027  177777                                                                         CMP     R1,#-1
11784  041312  001006                                                                                 BNE     $51620
11785  041314  020127  177777                                                                         CMP     R2,#-1
11786  041320  001003                                                                                 BEQ     $51621
11787  041322  020227  177777                                                                 $51620:
11788  041326  001402                          CALL ERROR                                              JSR     PC,ERROR
11789  041330                                  ENDIF                                           $51621:
11790  041330                                  IF R3 NE #-1 OR R4 NE #-1 OR R5 NE #-1 THEN             CMP     R3,#-1
11791  041330  004737  056274                                                                         BNE     $51622
11792  041334                                                                                          CMP     R4,#-1
11793  041334                                                                                          BNE     $51622
11794  041334                                                                                          CMP     R5,#-1
11795  041334  020027  177777                                                                         BEQ     $51623
11796  041340  001006                                                                          $51622:
11797  041342  020027  177777                  CALL ERROR                                              JSR     PC,ERROR
11798  041346  001003                          ENDIF                                           $51623:
11799  041350  020527  177777                  INLINE <JMP XASHN>                                      JMP XASHN
11800  041354  001402
11801  041356                                  ;+
11802  041356                                  ; INLINE TEST CASE
11803  041356  004737  056274                  ;-
11804  041362                                  TCMPNI: .WORD   010005          ;SRC1 DATA TYPE = UNSIGNED ZONED, LENGTH = 5
11805  041362                                          .WORD   CMPNI1          ; ''
11806  041362                                          .WORD   010005          ;SRC2 DATA TYPE = UNSIGNED ZONED, LENGTH = 5
11807  041362  000137  041404                          .WORD   CMPNI1          ; ''
11808
11809                                           CMPNI1: .BYTE   001,002,003,004,065     ;DECIMAL STRING = 12345
11810                                                   .EVEN
11811
11812
11813
11814  041366  010005
11815  041370  041376
11816  041372  010005
11817  041374  041376
11818
11819  041376     001     002     003
11820  041401     004     065
11821          041404
11822
```

```
11823                                   .SBTTL  ASHN
11824                                   ;*****************************************************************
11825                                   ;
11826                                   ;  ASHN TEST
11827                                   ;
11828                                   ;*****************************************************************
11829
11830  041404                           INLINE  <XASHN:>
11831  041404                                                                          XASHN:
11832  041404                           INLINE  <SCOPE>                                SCOPE
11833  041404  000004                                                                 MOV     #20,$TIMES
11834  041406                           LET $TIMES := #20                ;DO 20 ITERATIONS
11835  041406  012737  000020  000404                                                 MOV     TASH,COUNT
11836  041414                           LET COUNT := TASH                ;GET TEST COUNT
11837  041414  013737  063044  000466                                                 MOV     #TASH+2,TSTCAS
11838  041422                           LET TSTCAS := #TASH+2            ;POINT TO FIRST TEST CASE
11839  041422  012737  063046  000542                                                 CLR     SIGNO
11840  041430                           LET SIGNO := #0
11841  041430  005037  000446
11842                                   ;REPEAT
11843  041434                           INLINE  <$5056:>                               $5056:
11844  041434
11845  041434                             LET CC.EXP := #0                             CLR     CC.EXP
11846  041434  005037  000520
11847  041440                             LET DATTYP := #0                           CLR     DATTYP
11848  041440  005037  000462
11849
11850                                     ;+
11851                                     ; GET TEST DATA FROM TABLE
11852                                     ;-
11853
11854  041444                           LET R0 := TSTCAS                                                  MOV     TSTCAS,R0
11855  041444  013700  000542
11856  041450                           LET DATA00 := (R0)+              ;SRC.LENGTH                      MOV     (R0)+,DATA00
11857  041450  012037  000560
11858  041454                           LET DATA01 := (R0)+              ;DST.LENGTH                      MOV     (R0)+,DATA01
11859  041454  012037  000562
11860  041460                           LET DATA02 := (R0)               ;SHIFT.DSCR                      MOV     (R0),DATA02
11861  041460  011037  000564
11862  041464                           CALL CLRDSB                                                       JSR     PC,CLRDSB
11863  041464  004737  055520
11864
11865                                   ;+
11866                                   ; PUT TEST STRING INTO DSBUF1 WITHOUT THE SIGN
11867                                   ;-
11868
11869  041470                           LET R0 := DATA00                 ;SRC.LENGTH                      MOV     DATA00,R0
11870  041470  013700  000560
11871  041474                           LET R1 := #DSBUF1                ;SRC.ADDRESS                     MOV     #DSBUF1,R1
11872  041474  012701  062370
11873  041500                           WHILE R0 NE #0 DO                                         $51624:
11874  041500                                                                                     TST     R0
11875  041500  005700                                                                           BEQ     $51625
11876  041502  001404
11877  041504                             LET (R1)+ :B- #4                                        MOVB    #4,(R1)+
11878  041504  112721  000004
```

```
11879  041510                          LET R0 := R0 - #1
11880  041510  005300                                                    DEC     R0
11881  041512                        ENDDO
11882  041512  000772                                                    BR      $51624
11883  041514                                                    $51625:
11884
11885                                  ;+
11886                                  ; LOAD DS.EXP AND CC.EXP WITH EXPECTED RESULTS.
11887                                  ;-
11888
11889                                  ;GET SHIFT COUNT MAGNITUDE AND PUT IT INTO TEMP0
11890
11891  041514                          LET TEMP0 := DATA02
11892  041514  013737  000564  000474                                    MOV     DATA02,TEMP0
11893  041522                        IF #BIT07 SETIN TEMP0 THEN          ;NEGATIVE SHIFT COUNT
11894  041522  032737  000200  000474                                    BIT     #BIT07,TEMP0
11895  041530  001402                                                    BEQ     $51626
11896  041532                          LET TEMP0 := NEGATE TEMP0
11897  041532  005437  000474                                          NEG     TEMP0
11898  041536                        ENDIF
11899  041536                                                    $51626:
11900  041536                        LET TEMP0 := TEMP0 CLR.BY #177600
11901  041536  042737  177600  000474                                    BIC     #177600,TEMP0
11902
11903                                  ;TAKE CARE OF EXPECTED NBIT
11904
11905  041544                        IF SIGN0 EQ #-1 AND DATA00 NE #0 THEN
11906  041544  023727  000446  177777                                    CMP     SIGN0,#-1
11907  041552  001006                                                    BNE     $51627
11908  041554  005737  000560                                          TST     DATA00
11909  041560  001403                                                    BEQ     $51627
11910  041562                          LET CC.EXP := CC.EXP SET.BY #NBIT
11911  041562  052737  000010  000520                                    BIS     #NBIT,CC.EXP
11912  041570                        ENDIF
11913  041570                                                    $51627:
11914
11915                                  ;TAKE CARE OF ZERO LENGTH SOURCE OR DESTINATION
11916
11917  041570                        IF DATA01 NE #0 THEN
11918  041570  005737  000562                                          TST     DATA01
11919  041574  001414                                                    BEQ     $51630
11920  041576                          LET R0 := #DS.EXP
11921  041576  012700  062536                                          MOV     #DS.EXP,R0
11922  041602                          INCR R1 FROM #1 TO DATA01 BY #1
11923  041602  012701  000001                                          MOV     #1,R1
11924  041606  000401                                                    BR      $51631
11925  041610                                                    $51632:
11926  041610  005201                                                    INC     R1
11927  041612                                                    $51631:
11928  041612  020137  000562                                          CMP     R1,DATA01
11929  041616  003003                                                    BGT     $51633
11930  041620                            LET (R0)+ :B= #60
11931  041620  112720  000060                                          MOVB    #60,(R0)+
11932  041624                          ENDINC
11933  041624  000771                                                    BR      $51632
11934  041626                                                    $51633:
```

```
11935  041626                          ENDIF
11936  041626
11937  041626                          IF DATA00 EQ #0 OR DATA01 EQ #0 THEN                          $51630:
11938  041626  005737  000560                                                                              TST     DATA00
11939  041632  001403                                                                                      BEQ     $51634
11940  041634  005737  000562                                                                              TST     DATA01
11941  041640  001004                                                                                      BNE     $51635
11942  041642                                                                                        $51634:
11943  041642                            LET CC.EXP := CC.EXP SET.BY #ZBIT
11944  041642  052737  000004  000520                                                                      BIS     #ZBIT,CC.EXP
11945  041650                          ELSE
11946  041650  000567                                                                                      BR      $51636
11947  041652                                                                                        $51635:
11948
11949                                  ;TAKE CARE OF NEGATIVE SHIFT
11950
11951  041652                          IF #BIT07 SETIN DATA02 THEN
11952  041652  032737  000200  000564                                                                      BIT     #BIT07,DATA02
11953  041660  001465                                                                                      BEQ     $51637
11954  041662                            LET R0 := DATA00 - TEMP0          ;SRC.LEN - SHIFT COUNT
11955  041662  013700  000560                                                                              MOV     DATA00,R0
11956  041666  163700  000474                                                                              SUB     TEMP0,R0
11957  041672                            LET R1 := #DS.EXP + DATA01
11958  041672  012701  062536                                                                              MOV     #DS.EXP,R1
11959  041676  063701  000562                                                                              ADD     DATA01,R1
11960  041702                            LET R2 := #1
11961  041702  012702  000001                                                                              MOV     #1,R2
11962  041706                            LET R3 := DATA01
11963  041706  013703  000562                                                                              MOV     DATA01,R3
11964  041712                          IF R0 EQ #0 THEN
11965  041712  005700                                                                                      TST     R0
11966  041714  001012                                                                                      BNE     $51640
11967  041716                            IF DATA02 HIS #3000 THEN
11968  041716  023727  000564  003000                                                                      CMP     DATA02,#3000
11969  041724  103403                                                                                      BLO     $51641
11970  041726                              LET -(R1) :B= #61               ;ROUNDING
11971  041726  112741  000061                                                                              MOVB    #61,-(R1)
11972  041732                            ELSE
11973  041732  000403                                                                                      BR      $51642
11974  041734                                                                                        $51641:
11975  041734                              LET CC.EXP := CC.EXP SET.BY #ZBIT
11976  041734  052737  000004  000520                                                                      BIS     #ZBIT,CC.EXP
11977  041742                            ENDIF
11978  041742                          ENDIF                                                         $51642:
11979  041742
11980  041742                          IF R0 LT #0 THEN                                              $51640:
11981  041742
11982  041742  005700                                                                                      TST     R0
11983  041744  002003                                                                                      BGE     $51643
11984  041746                            LET CC.EXP := CC.EXP SET.BY #ZBIT
11985  041746  052737  000004  000520                                                                      BIS     #ZBIT,CC.EXP
11986  041754                          ENDIF                                                         $51643:
11987  041754
11988  041754                          WHILE R2 LE R0 AND R3 HI #0 DO                                $51644:
11989  041754                                                                                              CMP     R2,R0
11990  041754  020200
```

```
11991  041756  003017                                                          BGT     $51645
11992  041760  005703                                                          TST     R3
11993  041762  101415                                                          BLOS    $51645
11994  041764                          LET -(R1) :B= #64
11995  041764  112741  000064                                                 MOVB    #64,-(R1)
11996  041770                          IF R2 EQ #1 AND DATA02 HIS #3000 THEN
11997  041770  020227  000001                                                 CMP     R2,#1
11998  041774  001005                                                          BNE     $51646
11999  041776  023727  000564  003000                                         CMP     DATA02,#3000
12000  042004  103401                                                          BLO     $51646
12001  042006                            LET (R1) :B= (R1) + #1                ;ROUNDING
12002  042006  105211                                                          INCB    (R1)
12003  042010                          ENDIF                                 $51646:
12004  042010
12005  042010                          LET R2 := R2 + #1
12006  042010  005202                                                          INC     R2
12007  042012
12008  042012  005303                  LET R3 := R3 - #1                      DEC     R3
12009  042014                        ENDDO
12010  042014  000757                                                          BR      $51644
12011  042016                                                                $51645:
12012  042016                          IF R3 EQ #0 AND R2 LE R0 THEN
12013  042016  005703                                                          TST     R3
12014  042020  001005                                                          BNE     $51647
12015  042022  020200                                                          CMP     R2,R0
12016  042024  003003                                                          BGT     $51647
12017  042026
*2018  042026  052737  000002  000520    LET CC.EXP := CC.EXP SET.BY #VBIT    BIS     #VBIT,CC.EXP
12019  042034                          ENDIF
12020  042034                                                                $51647:
12021  042034                        ENDIF
12022  042034                                                                $51637:
12023
12024                                 ;TAKE CARE OF POSITIVE SHIFT
12025
12026  042034                        IF #BIT07 NOTSETIN DATA02 THEN
12027  042034  032737  000200  000564                                         BIT     #BIT07,DATA02
12028  042042  001072                                                          BNE     $51650
12029  042044                          LET TEMP1 := DATA00 + TEMP0           ;SRC.LEN + SHIFT COUNT
12030  042044  013737  000560  000476                                         MOV     DATA00,TEMP1
12031  042052  063737  000474  000476                                         ADD     TEMP0,TEMP1
12032  042060                          IF TEMP1 HI DATA01 THEN
12033  042060  023737  000476  000562                                         CMP     TEMP1,DATA01
12034  042066  101403                                                          BLOS    $51651
12035  042070                            LET CC.EXP := CC.EXP SET.BY #VBIT
12036  042070  052737  000002  000520                                         BIS     #VBIT,CC.EXP
12037  042076                          ENDIF                                 $51651:
12038  042076
12039  042076                          IF TEMP0 HIS DATA01 THEN              ;SHIFT COUNT >= DST.LEN
12040  042076  023737  000474  000562                                         CMP     TEMP0,DATA01
12041  042104  103420                                                          BLO     $51652
12042  042106                            LET CC.EXP := CC.EXP SET.BY #ZBIT
12043  042106  052737  000004  000520                                         BIS     #ZBIT,CC.EXP
12044  042114                            LET R1 := #DS.EXP
12045  042114  012701  062536                                                 MOV     #DS.EXP,R1
12046  042120                            INCR R0 FROM #1 TO DATA01 BY #1
```

```
12047  042120  012700  000001                                                          MOV     #1,R0
12048  042124  000401                                                                  BR      $51653
12049  042126                                                                  $51654:
12050  042126  005200                                                                  INC     R0
12051  042130                                                                  $51653:
12052  042130  020037  000562                                                          CMP     R0,DATA01
12053  042134  003003                                                                  BGT     $51655
12054  042136                          LET (R1)+ :B= #60
12055  042136  112721  000060                                                        MOVB    #60,(R1)+
12056  042142                        ENDINC
12057  042142  000771                                                                  BR      $51654
12058  042144                                                                  $51655:
12059  042144                      ELSE                                ;SHIFT COUNT < DST.LEN
12060  042144  000431                                                                  BR      $51656
12061  042146                                                                  $51652:
12062  042146                        LET R1 := #DS.EXP + DATA01
12063  042146  012701  062536                                                          MOV     #DS.EXP,R1
12064  042152  063701  000562                                                          ADD     DATA01,R1
12065  042156                        INCR R0 FROM #1 TO TEMP0 BY #1
12066  042156  012700  000001                                                          MOV     #1,R0
12067  042162  000401                                                                  BR      $51657
12068  042164                                                                  $51660:
12069  042164  005200                                                                  INC     R0
12070  042166                                                                  $51657:
12071  042166  020037  000474                                                          CMP     R0,TEMP0
12072  042172  003003                                                                  BGT     $51661
12073  042174                          LET -(R1) :B= #60
12074  042174  112741  000060                                                        MOVB    #60,-(R1)
12075  042200                        ENDINC
12076  042200  000771                                                                  BR      $51660
12077  042202                                                                  $51661:
12078  042202                        LET R0 := DATA00                          ;SRC.LEN
12079  042202  013700  000560                                                          MOV     DATA00,R0
12080  042206                        WHILE R1 HI #DS.EXP AND R0 HI #0 DO
12081  042206                                                                  $51662:
12082  042206  020127  062536                                                          CMP     R1,#DS.EXP
12083  042212  101406                                                                  BLOS    $51663
12084  042214  005700                                                                  TST     R0
12085  042216  101404                                                                  BLOS    $51663
12086  042220                          LET -(R1) :B= #64
12087  042220  112741  000064                                                        MOVB    #64,-(R1)
12088  042224                          LET R0 := R0 - #1
12089  042224  005300                                                                  DEC     R0
12090  042226                        ENDDO
12091  042226  000767                                                                  BR      $51662
12092  042230                                                                  $51663:
12093  042230                      ENDIF                                       $51656:
12094  042230                                                                  $51650:
12095  042230                    ENDIF
12096  042230                                                                  $51636:
12097  042230                  ENDIF
12098  042230
12099  042230                  IF #ZBIT SETIN CC.EXP THEN
12100  042230  032737  000004  000520                                                  BIT     #ZBIT,CC.EXP
12101  042236  001403                                                                  BEQ     $51664
12102  042240                    LET CC.EXP := CC.EXP CLR.BY #NBIT
```

```
12103  042240  042737  000010  000520                                                          BIC     #NBIT,CC.EXP
12104  042246                          ENDIF
12105  042246                                                                          $51664:
12106
12107                                  ;SAVE THE FIRST AND LAST EXPECTED DST DIGITS
12108
12109  042246                          LET DSTMP0 :B= DS.EXP
12110  042246  113737  062536  000552                                                  MOVB    DS.EXP,DSTMP0
12111  042254                          LET R0 := #DS.EXP + DATA01 - #1
12112  042254  012700  062536                                                         MOV     #DS.EXP,R0
12113  042260  063700  000562                                                         ADD     DATA01,R0
12114  042264  005300                                                                 DEC     R0
12115  042266                          LET DSTMP1 :B= (R0)
12116  042266  111037  000553                                                         MOVB    (R0),DSTMP1
12117
12118                                  ;+
12119                                  ; PERFORM THE ASHN INSTRUCTION WITH ALL SIX NUMERIC
12120                                  ; DATA TYPES.  'DATTYP' WILL CONTAIN THE DATA TYPE
12121                                  ; CURRENTLY BEING TESTED.
12122                                  ;-
12123
12124                                  ;INCR DATTYP FROM #0 TO #50000 BY #10000
12125  042272                          INLINE  <CLR  DATTYP>
12126  042272  005037  000462                                                          CLR  DATTYP
12127  042276                          INLINE  <BR  $5602>
12128  042276  000403                                                                 BR  $5602
12129  042300                          INLINE  <$5601:>
12130  042300                                                                         $5601:
12131  042300                          LET DATTYP := DATTYP + #10000
12132  042300  062737  010000  000462                                                 ADD     #10000,DATTYP
12133  042306                          INLINE  <$5602:>
12134  042306                                                                         $5602:
12135  042306                          IF DATTYP GT #50000 THEN
12136  042306  023727  000462  050000                                                 CMP     DATTYP,#50000
12137  042314  003402                                                                 BLE     $51665
12138  042316                            INLINE  <JMP  $5603>
12139  042316  000137  044076                                                         JMP  $5603
12140  042322                          ENDIF
12141  042322                                                                  $51665:
12142
12143                                    ;RESTORE FIRST AND LAST SRC DIGITS
12144  042322                            IF DATA00 HI #0 THEN                  ;SRC.LEN > 0
12145  042322  005737  000560                                                         TST     DATA00
12146  042326  101411                                                                 BLOS    $51666
12147  042330                              LET DSBUF1 :B= #4
12148  042330  112737  000004  062370                                                 MOVB    #4,DSBUF1
12149  042336                              LET R0 := #DSBUF1-1 + DATA00
12150  042336  012700  062367                                                         MOV     #DSBUF1-1,R0
12151  042342  063700  000560                                                         ADD     DATA00,R0
12152  042346                              LET (R0) :B= #4
12153  042346  112710  000004                                                         MOVB    #4,(R0)
12154  042352                            ENDIF
12155  042352                                                                  $51666:
12156
12157  042352                            ;RESTORE FIRST AND LAST DST DIGITS
12158  042352  005737  000562           IF DATA01 HI #0 THEN                  ;DST.LEN > 0
                                                                                       TST     DATA01
```

```
12159  042356  101411                                                                          BLOS    $51667
12160  042360
12161  042360  113737  000552  062536                    LET DS.EXP :B= DSTMP0                 MOVB    DSTMP0,DS.EXP
12162  042366
12163  042366  012700  062535                            LET R0 := #DS.EXP-1 + DATA01          MOV     #DS.EXP-1,R0
12164  042372  063700  000562                                                                  ADD     DATA01,R0
12165  042376
12166  042376  113710  000553                            LET (R0) :B= DSTMP1                   MOVB    DSTMP1,(R0)
12167  042402                                          ENDIF
12168  042402                                                                                  $51667:
12169
12170  042402                                          ;FINISH SETTING UP EXPECTED RESULTS ACCORDING TO DATA TYPE
12171  042402  005737  000462                          IF DATTYP EQ #0 THEN                  ;*** SIGNED ZONED ***
12172  042406  001067                                                                        TST     DATTYP
12173  042410                                                                                 BNE     $51670
12174  042410  105037  062367                            LET DSBUF1-1 :B= #0                ;RESTORE SRC AFTER LEADING SEPARATE
12175  042414                                                                                 CLRB    DSBUF1-1
12176  042414  00573?  000560                            IF DATA00 HI #0 THEN               ;SRC.LEN > 0
12177  042420  101414                                                                        TST     DATA00
12178  042422                                                                                 BLOS    $51671
12179  042422  012700  062367                              LET R0 := #DSBUF1-1 + DATA00
12180  042426  063700  000560                                                                MOV     #DSBUF1-1,R0
12181  042432                                                                                 ADD     DATA00,R0
12182  042432  005737  000446                              IF SIGN0 EQ #0 THEN               ;SIGN IS +
12183  042436  001003                                                                        TST     SIGN0
12184  042440                                                                                 BNE     $51672
12185  042440  112710  000064                                LET (R0) :B= #64
12186  042444                                                                                 MOVB    #64,(R0)
12187  042444  000402                                      ELSE                              ;SIGN IS -
12188  042446                                                                                 BR      $51673
12189  042446                                                                                $51672:
12190  042446  112710  000164                                LET (R0) :B= #164
12191  042452                                                                                 MOVB    #164,(R0)
12192  042452                                              ENDIF
12193  042452                                                                                $51673:
12194  042452                                          ENDIF
12195  042452                                                                                $51671:
12196  042452  105037  062535                          LET DS.EXP-1 :B= #0                   ;RESTORE DST AFTER LEADING SEPARATE
12197  042456                                                                                 CLRB    DS.EXP-1
12198  042456  005737  000562                          IF DATA01 HI #0 THEN                  ;DST.LEN > 0
12199  042462  101441                                                                        TST     DATA01
12200  042464                                                                                 BLOS    $51674
12201  042464  012700  062535                            LET R0 := #DS.EXP-1 + DATA01
12202  042470  063700  000562                                                                MOV     #DS.EXP-1,R0
12203  042474                                                                                 ADD     DATA01,R0
12204  042474  005737  000446                            IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN      ;SIGN IS +
12205  042500  001407                                                                        TST     SIGN0
12206  042502  005737  000560                                                               BEQ     $51675
12207  042506  001404                                                                        TST     DATA00
12208  042510  032737  000004  000520                                                       BEQ     $51675
12209  042516  001403                                                                        BIT     #ZBIT,CC.EXP
12210  042520                                                                                 BEQ     $51676
12211  042520                                                                                $51675:
12212  042520  152710  000060                              LET (R0) :B= (R0) SET.BY #60
12213  042524                                                                                 BISB    #60,(R0)
12214  042524  000402                                      ELSE                              ;SIGN IS -
                                                                                               BR      $51677
```

```
12215  042526                                                                                  $51676:
12216  042526
12217  042526  152710  000160                                                                        BISB    #160,(R0)
12218  042532
12219  042532                                                                                  $51677:
12220  042532
12221  042532  123737  000564  000560                                                                CMPB    DATA02,DATA00
12222  042540  103012                                                                              BHIS    $51700
12223  042542  032737  000200  000564                                                              BIT     #BIT07,DATA02
12224  042550  001006                                                                              BNE     $51700
12225  042552  023727  000446  177777                                                              CMP     SIGN0,#-1
12226  042560  001002                                                                              BNE     $51700
12227  042562
12228  042562  152710  000160                                                                        BISB    #160,(R0)
12229  042566
12230  042566                                                                                  $51700:
12231  042566
12232  042566                                                                                  $51674:
12233  042566
12234  042566                                                                                  $51670:
12235  042566
12236  042566  023727  000462  010000                                                              CMP     DATTYP,#10000
12237  042574  001025                                                                              BNE     $51701
12238  042576
12239  042576  042737  000010  000520                                                              BIC     #NBIT,CC.EXP
12240  042604
12241  042604  005737  000560                                                                      TST     DATA00
12242  042610  101406                                                                              BLOS    $51702
12243  042612
12244  042612  012700  062367                                                                      MOV     #DSBUF1-1,R0
12245  042616  063700  000560                                                                      ADD     DATA00,R0
12246  042622
12247  042622  112710  000064                                                                      MOVB    #64,(R0)
12248  042626
12249  042626                                                                                  $51702:
12250  042626
12251  042626  005737  000562                                                                      TST     DATA01
12252  042632  101406                                                                              BLOS    $51703
12253  042634
12254  042634  012700  062535                                                                      MOV     #DS.EXP-1,R0
12255  042640  063700  000562                                                                      ADD     DATA01,R0
12256  042644
12257  042644  152710  000060                                                                      BISB    #60,(R0)
12258  042650
12259  042650
12260  042650
12261  042650                                                                                  $51703:
12262  042650
12263  042650  023727  000462  020000                                                          $51701:
12264  042656  001102                                                                              CMP     DATTYP,#20000
12265  042660                                                                                      BNE     $51704
12266  042660  005737  000560
12267  042664  101427                                                                              TST     DATA00
12268  042666                                                                                      BLOS    $51705
12269  042666  023727  000446  177777
12270  042674  001007                                                                              CMP     SIGN0,#-1
                                                                                                   BNE     $51706
```

```
                                    LET (R0) :B= (R0) SET.BY #160
                                  ENDIF
                                IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02  AND SIGN0 EQ #-1 THEN
                                  LET (R0) :B= (R0) SET.BY #160
                                ENDIF
                                ENDIF
                              ENDIF
                              IF DATTYP EQ #10000 THEN                          ;*** UNSIGNED ZONED ***
                                LET CC.EXP := CC.EXP CLR.BY #NBIT
                                IF DATA00 HI #0 THEN                            ;SRC.LEN > 0
                                  LET R0 := #DSBUF1-1 + DATA00
                                  LET (R0) :B= #64
                                ENDIF
                                IF DATA01 HI #0 THEN                            ;DST.LEN > 0
                                  LET R0 := #DS.EXP-1 + DATA01
                                  LET (R0) :B= (R0) SET.BY #60
                                ENDIF
                              ENDIF
                              IF DATTYP EQ #20000 THEN                          ;*** TRAILING OVERPUNCH ***
                                IF DATA00 HI #0 THEN                            ;SRC.LEN > 0
                                  IF SIGN0 EQ #-1 AND #ZBIT NOTSETIN CC.EXP THEN
```

```
12271  042676  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
12272  042704  001003                                                                          BNE     $51706
12273  042706                        LET CC.EXP := CC.EXP SET.BY #NBIT   ;RESTORE NBIT AFTER UNSIGNED ZONED
12274  042706  052737  000010  000520                                                          BIS     #NBIT,CC.EXP
12275  042714                      ENDIF
12276  042714                                                                          $51706:
12277  042714                      LET R0 := #DSBUF1-1 + DATA00
12278  042714  012700  062367                                                                  MOV     #DSBUF1-1,R0
12279  042720  063700  000560                                                                  ADD     DATA00,R0
12280  042724                      IF SIGN0 EQ #0 THEN                 ;SIGN IS +
12281  042724  005737  000446                                                                  TST     SIGN0
12282  042730  001003                                                                          BNE     $51707
12283  042732                        LET (R0) :B= #104
12284  042732  112710  000104                                                                  MOVB    #104,(R0)
12285  042736                      ELSE                                ;SIGN IS -
12286  042736  000402                                                                          BR      $51710
12287  042740                                                                          $51707:
12288  042740                        LET (R0) :B= #115
12289  042740  112710  000115                                                                  MOVB    #115,(R0)
12290  042744                      ENDIF
12291  042744                                                                          $51710:
12292  042744                    ENDIF
12293  042744                                                                          $51705:
12294  042744                    IF DATA01 HI #0 THEN                ;DST.LEN > 0
12295  042744  005737  000562                                                                  TST     DATA01
12296  042750  101445                                                                          BLOS    $51711
12297  042752                      LET R0 := #DS.EXP-1 + DATA01
12298  042752  012700  062535                                                                  MOV     #DS.EXP-1,R0
12299  042756  063700  000562                                                                  ADD     DATA01,R0
12300  042762                      IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN   ;SIGN IS +
12301  042762  005737  000446                                                                  TST     SIGN0
12302  042766  001407                                                                          BEQ     $51712
12303  042770  005737  000560                                                                  TST     DATA00
12304  042774  001404                                                                          BEQ     $51712
12305  042776  032737  000004  000520                                                          BIT     #ZBIT,CC.EXP
12306  043004  001402                                                                          BEQ     $51713
12307  043006                                                                          $51712:
12308  043006                        LET R1 :B- #0
12309  043006  105001                                                                          CLRB    R1
12310  043010                      ELSE                                ;SIGN IS -
12311  043010  000402                                                                          BR      $51714
12312  043012                                                                          $51713:
12313  043012                        LET R1 :B= #10.
12314  043012  112701  000012                                                                  MOVB    #10.,R1
12315  043016                      ENDIF
12316  043016                                                                          $51714:
12317  043016                    IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
12318  043016  123737  000564  000560                                                          CMPB    DATA02,DATA00
12319  043024  103012                                                                          BHIS    $51715
12320  043026  032737  000200  000564                                                          BIT     #BIT07,DATA02
12321  043034  001006                                                                          BNE     $51715
12322  043036  023727  000446  177777                                                          CMP     SIGN0,#-1
12323  043044  001002                                                                          BNE     $51715
12324  043046                        LET R1 :B= #10.
12325  043046  112701  000012                                                                  MOVB    #10.,R1
12326  043052                    ENDIF
```

```
12327  043052
12328  043052
12329  043052  151001                          LET R1 :B= R1 SET.BY (R0)
12330  043054
12331  043054  042701  177760                  LET R1 := R1 CLR.BY #177760
12332  043060
12333  043060  116110  055254                  LET (R0) :B= OVPNCH(R1)
12334  043064                                  ENDIF
12335  043064                                ENDIF
12336  043064
12337  043064
12338  043064                                IF DATTYP EQ #30000 THEN
12339  043064  023727  000462  030000
12340  043072  001063
12341  043074                                  IF DATA00 HI #0 THEN
12342  043074  005737  000560
12343  043100  101412
12344  043102                                    IF SIGN0 EQ #0 THEN
12345  043102  005737  000446
12346  043106  001004
12347  043110                                      LET DSBUF1 :B= #104
12348  043110  112737  000104  062370           ELSE
12349  043116
12350  043116  000403                            LET DSBUF1 :B= #115
12351  043120                                    ENDIF
12352  043120
12353  043120  112737  000115  062370         ENDIF
12354  043126
12355  043126                                IF DATA01 HI #0 THEN                    ;DST.LEN > 0
12356  043126
12357  043126
12358  043126
12359  043126  005737  000562
12360  043132  101443
12361  043134                                  IF SIGN0 EQ #0 OR DATA00 EQ #0 OR #ZBIT SETIN CC.EXP THEN       ;SIGN IS +
12362  043134  005737  000446
12363  043140  001407
12364  043142  005737  000560
12365  043146  001404
12366  043150  032737  000004  000520
12367  043156  001402
12368  043160
12369  043160                                    LET R1 :B= #0
12370  043160  105001
12371  043162                                  ELSE                                    ;SIGN IS -
12372  043162  000402
12373  043164
12374  043164                                    LET R1 :B= #10.
12375  043164  112701  000012
12376  043170                                  ENDIF
12377  043170
12378  043170
12379  043170  123737  000564  000560         IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
12380  043176  103012
12381  043200  032737  000200  000564
12382  043206  001006
```

```
                $51715:
                        BISB    (R0),R1
                        BIC     #177760,R1
                        MOVB    OVPNCH(R1),(R0)
                $51711:
                $51704:
;*** LEADING OVERPUNCH ***
                        CMP     DATTYP,#30000
                        BNE     $51716
;SRC.LEN > 0
                        TST     DATA00
                        BLOS    $51717
;SIGN IS +
                        TST     SIGN0
                        BNE     $51720
                        MOVB    #104,DSBUF1
;SIGN IS -
                        BR      $51721
                $51720:
                        MOVB    #115,DSBUF1
                $51721:
                $51717:
                        TST     DATA01
                        BLOS    $51722
                        TST     SIGN0
                        BEQ     $51723
                        TST     DATA00
                        BEQ     $51723
                        BIT     #ZBIT,CC.EXP
                        BEQ     $51724
                $51723:
                        CLRB    R1
                        BR      $51725
                $51724:
                        MOVB    #10.,R1
                $51725:
                        CMPB    DATA02,DATA00
                        BHIS    $51726
                        BIT     #BIT07,DATA02
                        BNE     $51726
```

```
12383  043210  023727  000446  177777                                                    CMP     SIGN0,#-1
12384  043216  001002                                                                    BNE     $51726
12385  043220                        LET R1 :B= #10.
12386  043220  112701  000012                                                            MOVB    #10.,R1
12387  043224                      ENDIF
12388  043224                                                                        $51726:
12389  043224                      LET R1 :B= R1 SET.BY DS.EXP
12390  043224  153701  062536                                                            BISB    DS.EXP,R1
12391  043230                      LET R1 := R1 CLR.BY #177760
12392  043230  042701  177760                                                            BIC     #177760,R1
12393  043234                      LET DS.EXP :B= OVPNCH(R1)
12394  043234  116137  055254  062536                                                    MOVB    OVPNCH(R1),DS.EX
12395  043242                    ENDIF
12396  043242                                                                        $51722:
12397  043242                  ENDIF
12398  043242                                                                        $51716:
12399  043242                  IF DATTYP EQ #40000 THEN                          ;*** TRAILING SEPARATE ***
12400  043242  023727  000462  040000                                                    CMP     DATTYP,#40000
12401  043250  001071                                                                    BNE     $51727
12402
12403                            ;PUT SIGN INTO SOURCE
12404
12405  043252                    LET TEMP0 := #DSBUF1 + DATA00
12406  043252  012737  062370  000474                                                    MOV     #DSBUF1,TEMP0
12407  043260  063737  000560  000474                                                    ADD     DATA00,TEMP0
12408  043266                    IF SIGN0 EQ #0 THEN                               ;SIGN IS +
12409  043266  005737  000446                                                            TST     SIGN0
12410  043272  001004                                                                    BNE     $51730
12411  043274
12412  043274  112777  000053  135172                                                    MOVB    #53,@TEMP0
12413  043302                    ELSE                                              ;SIGN IS -
12414  043302  000403                                                                    BR      $51731
12415  043304                                                                        $51730:
12416  043304                      LET @TEMP0 :B= #55
12417  043304  112777  000055  135162                                                    MOVB    #55,@TEMP0
12418  043312                    ENDIF
12419  043312                                                                        $51731:
12420
12421                            ;PUT EXPECTED SIGN INTO DS.EXP
12422
12423  043312                    LET TEMP0 := #DS.EXP + DATA01
12424  043312  012737  062536  000474                                                    MOV     #DS.EXP,TEMP0
12425  043320  063737  000562  000474                                                    ADD     DATA01,TEMP0
12426  043326                    IF SIGN0 EQ #0 OR #ZBIT SETIN CC.EXP THEN
12427  043326  005737  000446                                                            TST     SIGN0
12428  043332  001404                                                                    BEQ     $51732
12429  043334  032737  000004  000520                                                    BIT     #ZBIT,CC.EXP
12430  043342  001404                                                                    BEQ     $51733
12431  043344                                                                        $51732:
12432  043344                      LET @TEMP0 :B= #53
12433  043344  112777  000053  135122                                                    MOVB    #53,@TEMP0
12434  043352                    ELSE
12435  043352  000403                                                                    BR      $51734
12436  043354                                                                        $51733:
12437  043354                      LET @TEMP0 :B= #55
12438  043354  112777  000055  135112                                                    MOVB    #55,@TEMP0
```

```
12439  043362                                    ENDIF
12440  043362                                                                                    $51734:
12441  043362                                    IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
12442  043362  123737  000564  000560                                                                CMPB    DATA02,DATA00
12443  043370  103013                                                                               BHIS    $51735
12444  043372  032737  000200  000564                                                                BIT     #BIT07,DATA02
12445  043400  001007                                                                               BNE     $51735
12446  043402  023727  000446  177777                                                                CMP     SIGN0,#-1
12447  043410  001003                                                                               BNE     $51735
12448  043412
12449  043412  112777  000055  135054                  LET @TEMP0 :B= #55                           MOVB    #55,@TEMP0
12450  043420                                    ENDIF
12451  043420                                                                                    $51735:
12452  043420                                    IF DATA01 EQ #0 THEN                    ;DST.LEN = 0
12453  043420  005737  000562                                                                      TST     DATA01
12454  043424  001003                                                                               BNE     $51736
12455  043426
12456  043426  042737  000002  000520                  LET CC.EXP := CC.EXP CLR.BY #VBIT            BIC     #VBIT,CC.EXP
12457  043434                                    ENDIF
12458  043434                                                                                  $51736:
12459  043434                                  ENDIF
12460  043434                                                                                  $51727:
12461  043434                                  IF DATTYP EQ #50000 THEN                ;*** LEADING SEPARATE ***
12462  043434  023727  000462  050000                                                                CMP     DATTYP,#50000
12463  043442  001075                                                                               BNE     $51737
12464  043444
12465  043444  012737  062536  000474                  LET TEMP0 := #DS.EXP + DATA01                MOV     #DS.EXP,TEMP0
12466  043452  063737  000562  000474                                                                ADD     DATA01,TEMP0
12467  043460
12468  043460  105077  135010                  LET @TEMP0 :B= #0                ;RESTORE DS.EXP FROM TRAILING SEPARATE
12469  043464                                                                                        CLRB    @TEMP0
12470  043464  012737  062474  000474                  LET TEMP0 := #DS.DST + DATA01                MOV     #DS.DST,TEMP0
12471  043472  063737  000562  000474                                                                ADD     DATA01,TEMP0
12472  043500
12473  043500  105077  134770                  LET @TEMP0 :B= #0                ;RESTORE DS.DST FROM TRAILING SEPARATE
12474                                                                                                CLRB    @TEMP0
12475                                           ;PUT SIGN INTO SOURCE
12476
12477  043504                                   IF SIGN0 EQ #0 THEN                      ;SIGN IS +
12478  043504  005737  000446                                                                      TST     SIGN0
12479  043510  001004                                                                               BNE     $51740
12480  043512
12481  043512  112737  000053  062367                  LET DSBUF1-1 :B= #53                         MOVB    #53,DSBUF1-1
12482  043520                                   ELSE                                     ;SIGN IS -
12483  043520  000403                                                                               BR      $51741
12484  043522                                                                                  $51740:
12485  043522
12486  043522  112737  000055  062367                  LET DSBUF1-1 :B= #55                         MOVB    #55,DSBUF1-1
12487  043530                                   ENDIF
12488  043530                                                                                  $51741:
12489  043530
12490  043530  005737  000446                  IF SIGN0 EQ #0 OR #ZBIT SETIN CC.EXP THEN
12491  043534  001404                                                                               TST     SIGN0
12492  043536  032737  000004  000520                                                                BEQ     $51742
12493  043544  001404                                                                               BIT     #ZBIT,CC.EXP
12494  043546                                                                                        BEQ     $51743
                                                                                                $51742:
```

```
12495  043546
12496  043546  112737  000053  062535                    LET DS.EXP-1 :B= #53                                                MOVB    #53,DS.EXP-1
12497  043554
12498  043554  000403                                  ELSE                                                                BR      $51744
12499  043556                                                                                                    $51743:
12500  043556                                            LET DS.EXP-1 :B= #55
12501  043556  112737  000055  062535                                                                              MOVB    #55,DS.EXP-1
12502  043564                                          ENDIF
12503  043564                                                                                                    $51744:
12504  043564                                          IFB DATA02 LO DATA00 AND #BIT07 NOTSETIN DATA02 AND SIGN0 EQ #-1 THEN
12505  043564  123737  000564  000560                                                                              CMPB    DATA02,DATA00
12506  043572  103013                                                                                             BHIS    $51745
12507  043574  032737  000200  000564                                                                              BIT     #BIT07,DATA02
12508  043602  001007                                                                                             BNE     $51745
12509  043604  023727  000446  177777                                                                              CMP     SIGN0,#-1
12510  043612  001003                                                                                             BNE     $51745
12511  043614
12512  043614  112737  000055  062535                    LET DS.EXP-1 :B= #55                                                MOVB    #55,DS.EXP-1
12513  043622                                          ENDIF
12514  043622                                                                                                    $51745:
12515  043622                                          IF DATA01 EQ #0 THEN                          ;DST.LEN = 0
12516  043622  005737  000562                                                                                     TST     DATA01
12517  043626  001003                                                                                             BNE     $51746
12518  043630
12519  043630  042737  000002  000520                    LET CC.EXP := CC.EXP CLR.BY #VBIT                                   BIC     #VBIT,CC.EXP
12520  043636                                          ENDIF
12521  043636                                                                                                    $51746:
12522  043636                                        ENDIF
12523  043636                                                                                                    $51737:
12524
12525                                                 ;+
12526                                                 ; SET UP THE GPR'S AND DO THE ASHN INSTRUCTION
12527                                                 ;-
12528
12529  043636                                        LET R0 := DATA00 SET.BY DATTYP
12530  043636  013700  000560                                                                                     MOV     DATA00,R0
12531  043642  053700  000462                                                                                     BIS     DATTYP,R0
12532  043646                                        LET R1 := #DSBUF1
12533  043646  012701  062370                                                                                     MOV     #DSBUF1,R1
12534  043652                                        LET R2 := DATA01 SET.BY DATTYP
12535  043652  013702  000562                                                                                     MOV     DATA01,R2
12536  043656  053702  000462                                                                                     BIS     DATTYP,R2
12537  043662
12538  043662  012703  062474                        LET R3 := #DS.DST                                                   MOV     #DS.DST,R3
12539  043666                                        LET R4 := DATA02
12540  043666  013704  000564                                                                                     MOV     DATA02,R4
12541  043672                                        LET R5 := #-1
12542  043672  012705  177777                                                                                     MOV     #-1,R5
12543  043676                                        INLINE   <ASHN>
12544  043676  076056                                                                                            ASHN
12545
12546                                                 ;+
12547                                                 ; CHECK THE RESULTS AND REPORT ERRORS
12548                                                 ;-
12549
12550  043700                                        LET CC := PSW
```

```
12551  043700  013737  177776  000516                    MOV     PSW,CC
12552  043706
12553  043706  042737  177760  000516    LET CC := CC CLR.BY #177760
                                          BIC     #177760,CC
12554  043714
12555  043714  023737  000516  000520    IF CC NE CC.EXP THEN
                                          CMP     CC,CC.EXP
12556  043722  001402                     BEQ     $51747
12557  043724
12558  043724  004737  056274              CALL ERROR
                                          JSR     PC,ERROR
12559  043730                            ENDIF
12560  043730                          $51747:
12561  043730                            IF R0 NE #0 OR R1 NE #0 OR R4 NE #0 THEN
12562  043730  005700                     TST     R0
12563  043732  001004                     BNE     $51750
12564  043734  005701                     TST     R1
12565  043736  001002                     BNE     $51750
12566  043740  005704                     TST     R4
12567  043742  001402                     BEQ     $51751
12568  043744                          $51750:
12569  043744
12570  043744  004737  056274              CALL ERROR
                                          JSR     PC,ERROR
12571  043750                            ENDIF
12572  043750                          $51751:
12573  043750
12574  043750  013737  000562  000474    LET TEMP0 := DATA01 SET.BY DATTYP
                                          MOV     DATA01,TEMP0
12575  043756  053737  000462  000474    BIS     DATTYP,TEMP0
12576  043764
12577  043764  020237  000474            IF R2 NE TEMP0 THEN
                                          CMP     R2,TEMP0
12578  043770  001402                     BEQ     $51752
12579  043772
12580  043772  004737  056274              CALL ERROR
                                          JSR     PC,ERROR
12581  043776                            ENDIF
12582  043776                          $51752:
12583  043776
12584  043776  020327  062474            IF R3 NE #DS.DST THEN
                                          CMP     R3,#DS.DST
12585  044002  001402                     BEQ     $51753
12586  044004
12587  044004  004737  056274              CALL ERROR          ;DS.EXP AND DS.DST DO NOT MATCH
                                          JSR     PC,ERROR
12588  044010                            ENDIF
12589  044010                          $51753:
12590
12591  044010                          ;COMPARE DS.EXP WITH DS.DST
12592  044010  005037  000454    LET ERRFLG := #0                ;CLEAR ERROR FLAG
                                          CLR     ERRFLG
12593  044014
12594  044014  012700  000041    LET R0 := #41
                                          MOV     #41,R0
12595  044020
12596  044020  012701  062473    LET R1 := #DS.DST-1
                                          MOV     #DS.DST-1,R1
12597  044024
12598  044024  012702  062535    LET R2 := #DS.EXP-1
                                          MOV     #DS.EXP-1,R2
12599  044030
12600  044030                            WHILE R0 NE #0 AND ERRFLG EQ #0 DO
12601  044030  005700                   $51754:
                                          TST     R0
12602  044032  001412                     BEQ     $51755
12603  044034  005737  000454            TST     ERRFLG
12604  044040  001007                     BNE     $51755
12605  044042
12606  044042  122122              IFB (R1)+ NE (R2)+ THEN
                                          CMPB    (R1)+,(R2)+
```

```
12607  044044  001403                                                              BEQ     $51756
12608  044046                                    LET ERRFLG := #-1
12609  044046  012737  177777  000454                                            MOV     #-1,ERRFLG
12610  044054                                  ENDIF
12611  044054                                                                $51756:
12612  044054                                  LET R0 := R0 - #1
12613  044054  005300                                                             DEC     R0
12614  044056                                ENDDO
12615  044056  000764                                                             BR      $51754
12616  044060                                                                $51755:
12617  044060                                  IF ERRFLG NE #0 THEN
12618  044060  005737  000454                                                    TST     ERRFLG
12619  044064  001402                                                             BEQ     $51757
12620  044066                                    CALL ERROR
12621  044066  004737  056274                                                    JSR     PC,ERROR
12622  044072                                  ENDIF
12623  044072                                                                $51757:
12624                                         ;ENDINC
12625  044072                                 INLINE  <JMP  $5601>
12626  044072  000137  042300                                                    JMP  $5601
12627  044076                                 INLINE  <$5603:>
12628  044076                                                                    $5603:
12629
12630  044076                                 INCR R0 FROM #DS.EXP-1 TO #DS.EXP+37 BY #1
12631  044076  012700  062535                                                    MOV     #DS.EXP-1,R0
12632  044102  000401                                                             BR      $51760
12633  044104                                                                $51761:
12634  044104  005200                                                             INC     R0
12635  044106                                                                $51760:
12636  044106  020027  062575                                                    CMP     R0,#DS.EXP+37
12637  044112  003002                                                             BGT     $51762
12638  044114                                    LET (R0) :B= #0               ;CLEAR DS.DST
12639  044114  105010                                                             CLRB    (R0)
12640  044116                                  ENDINC
12641  044116  000772                                                             BR      $51761
12642  044120                                                                $51762:
12643  044120                                  LET SIGN0 := COMP SIGN0        ;REPEAT THE TEST CASE WITH A NEGATIVE
12644  044120  005137  000446                                                    COM     SIGN0
12645                                          IF SIGN0 EQ #0 THEN            ;  SIGN BEFORE MOVING ON TO THE NEXT ONE
12646  044124
12647  044124  005737  000446                                                    TST     SIGN0
12648  044130  001005                                                             BNE     $51763
12649  044132                                    LET TSTCAS := TSTCAS + #6
12650  044132  062737  000006  000542                                           ADD     #6,TSTCAS
12651  044140                                    LET COUNT := COUNT - #1
12652  044140  005337  000466                                                    DEC     COUNT
12653  044144                                  ENDIF
12654  044144                                                                $51763:
12655                                         ;UNTIL COUNT EQ #0
12656  044144                                 IF COUNT NE #0 THEN
12657  044144  005737  000466                                                    TST     COUNT
12658  044150  001402                                                             BEQ     $51764
12659  044152                                    INLINE   <JMP   $5056>
12660  044152  000137  041434                                                    JMP   $5056
12661  044156                                 ENDIF
12662  044156                                                                $51764:
```

```
12663
12664
12665                                   ;+
12666                                   ; DO ONE INLINE CASE - ASHNI
12667                                   ;-
12668
12669  044156
12670  044156  004737  055520          CALL CLRDSB                             JSR     PC,CLRDSB
12671
12672  044162                          ;LOAD SRC STRING INTO DSBUF1
12673  044162  012700  062367          LET R0 := #DSBUF1-1                     MOV     #DSBUF1-1,R0
12674  044166
12675  044166  112720  000053          LET (R0)+ :B= #53                       ;LEADING SEPARATE SIGN OF +
                                                                                MOVB    #53,(R0)+
12676  044172                                                                  ;PUT SRC MAGNITUDE OF 9999
12677  044172  112720  000011          LET (R0)+ :B= #9.                       MOVB    #9.,(R0)+
12678  044176                                                                  ;   INTO DSBUF1
12679  044176  112720  000011          LET (R0)+ :B= #9.                       MOVB    #9.,(R0)+
12680  044202
12681  044202  112720  000011          LET (R0)+ :B= #9.                       MOVB    #9.,(R0)+
12682  044206
12683  044206  112710  000011          LET (R0) :B= #9.                        MOVB    #9.,(R0)
12684  044212
12685  044212  005000                  LET R0 := #0                            CLR     R0
12686  044214
12687  044214  005001                  LET R1 := #0                            CLR     R1
12688  044216
12689  044216  005002                  LET R2 := #0                            CLR     R2
12690  044220
12691  044220  005003                  LET R3 := #0                            CLR     R3
12692  044222
12693  044222  005004                  LET R4 := #0                            CLR     R4
12694  044224
12695  044224  005005                  LET R5 := #0                            CLR     R5
12696  044226
12697  044226  076156                  INLINE   <ASHNI>                        ASHNI
12698  044230
12699  044230  044422                  INLINE   <.WORD  TASHNI>                .WORD   TASHNI
12700  044232
12701  044232  044426                  INLINE   <.WORD  TASHNI+4>              .WORD   TASHNI+4
12702  044234
12703  044234  000002                  INLINE   <.WORD  000002>                ;SHIFT COUNT - 2, RND DIGIT = 0
                                                                                .WORD   000002
12704  044236
12705  044236  013737  177776  000516  LET CC := PSW                           MOV     PSW,CC
12706  044244
12707  044244  042737  177760  000516  LET CC := CC CLR.BY #177760            BIC     #177760,CC
12708  044252
12709  044252  023727  000516  000006  IF CC NE #6 THEN                       ;VBIT SHOULD BE SET
                                                                                CMP     CC,#6
12710  044260  001402                                                          BEQ     $51765
12711  044262
12712  044262  004737  056274            CALL ERROR                          JSR     PC,ERROR
12713  044266
12714  044266                          ENDIF                                   $51765:
12715  044266
12716  044266  005700                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN TST    R0
12717  044270  001004                                                          BNE     $51766
12718  044272  005701                                                          TST     R1
```

```
12719  044274  001002                                                    BNE     $51766
12720  044276  005702                                                    TST     R2
12721  044300  001402                                                    BEQ     $51767
12722  044302                                                          $51766:
12723  044302                    CALL ERROR
12724  044302  004737  056274                                          JSR     PC,ERROR
12725  044306                    ENDIF
12726  044306                                                          $51767:
12727  044306                    IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
12728  044306  005703                                                    TST     R3
12729  044310  001004                                                    BNE     $51770
12730  044312  005704                                                    TST     R4
12731  044314  001002                                                    BNE     $51770
12732  044316  005705                                                    TST     R5
12733  044320  001402                                                    BEQ     $51771
12734  044322                                                          $51770:
12735  044322                      CALL ERROR
12736  044322  004737  056274                                          JSR     PC,ERROR
12737  044326                    ENDIF
12738  044326                                                          $51771:
12739
12740  044326                    ;CHECK DS.DST
12741  044326  012700  062474    LET R0 := #DS.DST                       MOV     #DS.DST,R0
12742  044332                    IFB (R0)+ NE #173 THEN
12743  044332  122027  000173                                          CMPB    (R0)+,#173
12744  044336  001402                                                    BEQ     $51772
12745  044340                      CALL ERROR
12746  044340  004737  056274                                          JSR     PC,ERROR
12747  044344                    ENDIF
12748  044344                                                          $51772:
12749  044344
12750  044344  122027  000060    IFB (R0)+ NE #60 THEN                   CMPB    (R0)+,#60
12751  044350  001402                                                    BEQ     $51773
12752  044352                      CALL ERROR
12753  044352  004737  056274                                          JSR     PC,ERROR
12754  044356                    ENDIF
12755  044356                                                          $51773:
12756  044356
12757  044356  005037  000454    LET ERRFLG := #0                        CLR     ERRFLG
12758  044362                    WHILE ERRFLG EQ #0 AND R0 NE #DS.DST+37 DO
12759  044362                                                          $51774:
12760  044362  005737  000454                                          TST     ERRFLG
12761  044366  001013                                                    BNE     $51775
12762  044370  020027  062533                                          CMP     R0,#DS.DST+37
12763  044374  001410                                                    BEQ     $51775
12764  044376                      IFB (R0)+ NE #0 THEN
12765  044376  105720                                                    TSTB    (R0)+
12766  044400  001405                                                    BEQ     $51776
12767  044402                        CALL ERROR
12768  044402  004737  056274                                          JSR     PC,ERROR
12769  044406                        LET ERRFLG := #-1
12770  044406  012737  177777  000454                                  MOV     #-1,ERRFLG
12771  044414                      ENDIF
12772  044414                                                          $51776:
12773  044414
12774  044414  000762                    ENDDO                         BR      $51774
```

```
12775  044416                                                                                  $51775:
12776  044416                          INLINE   <JMP   CIS6END>
12777  044416  000137  044432                                                                        JMP   CIS6END
12778
12779
12780                                  ;+
12781                                  ; INLINE TEST CASE
12782                                  ;-
12783
12784  044422  050004                  TASHNI: .WORD   050004          ;SRC.DSCR, LEADING SEPARATE, SRC.LEN = 4
12785  044424  062370                          .WORD   DSBUF1          ;SRC.DSCR
12786  044426  030002                          .WORD   030002          ;DST.DSCR, LEADING OVERPUNCH, DST.LEN = 2
12787  044430  062474                          .WORD   DS.DST          ;DST.DSCR
12788
12789
12790
12791  044432                          INLINE   <CIS6END:>
12792  044432                                                                                  CIS6END:
12793
12794
```

```
12795                                ;*****************************************************************
12796                                ;*****************************************************************
12797                                ;++
12798                                ;                C I S 7      M O D U L E
12799                                ;
12800                                ;  THIS MODULE TESTS THE PACKED DATA TYPE ARITHMETIC
12801                                ;  INSTRUCTIONS: ADDP, SUBP, CMPP, ASHP.
12802                                ;--
12803                                ;*****************************************************************
12804                                ;*****************************************************************
12805
12806
12807
12808
12809
12810                                .SBTTL  CIS7 INITIALIZATION
12811                                ;********************************************* *****************
12812                                ;
12813                                ;  CIS7 INITIALIZATION
12814                                ;
12815                                ;*****************************************************************
12816
12817                                ;IF SWR<5:0> ARE CLEARED OR IF SWR<3> IS SET THEN EXECUTE
12818                                ;  THE CIS7 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.
12819
12820  044432                        INLINE   <SCOPE>
12821  044432  000004                                                              SCOPE
12822
12823  044434                        LET TEMP0 := @SWR CLR.BY #177700
12824  044434  017737  133766  000474                                              MOV     @SWR,TEMP0
12825  044442  042737  177700  000474                                              BIC     #177700,TEMP0
12826  044450
12827  044450  005737  000474       IF TEMP0 NE #0 THEN                          TST     TEMP0
12828  044454  001406                                                             BEQ     $51777
12829  044456
12830  044456  032737  000010  000474    IF #BIT3 NOTSETIN TEMP0 THEN            BIT     #BIT3,TEMP0
12831  044464  001002                                                             BNE     $52000
12832  044466
12833  044466  000137  052020              INLINE   <JMP   CIS7END>               JMP   CIS7END
12834  044472                          ENDIF
12835  044472                                                                  $52000:
12836  044472                        ENDIF
12837  044472                                                                  $51777:
12838  044472
12839  044472  012737  000007  000544  LET CTL :- #7          ;CONTROL CHIP NUMBER  MOV     #7,CTL
12840  044500
12841  044500  005037  000454  LET ERRFLG :  #0       ;INITIALIZE ERROR FLAG      CLR     ERRFLG
12842  044504
12843  044504  012737  000340  177776  LET PSW := #340                           MOV     #340,PSW
12844  044512
12845  044512  012737  000001  000550  LET ERR := #1                             MOV     #1,ERR
```

```
12846                                   .SBTTL  ADDP
12847                                   ;*****************************************************************
12848                                   ;
12849                                   ;       ADDP TEST
12850                                   ;
12851                                   ;*****************************************************************
12852
12853  044520                           INLINE <XADDP:>                                                    XADDP:
12854  044520                           INLINE <SCOPE>                                                     SCOPE
12855  044520
12856  044520  000004                   LET $TIMES := #20               ;ITERATION COUNT                   MOV     #20,$TIMES
12857  044522
12858  044522  012737  000020  000404   LET COUNT := TADD               ;# OF TEST CASES                   MOV     TADD,COUNT
12859  044530
12860  044530  013737  063200  000466   LET TSTCAS := #TADD+2           ;POINT TO FIRST TEST CASE          MOV     #TADD+2,TSTCAS
12861  044536
12862  044536  012737  063202  000542
12863
12864                                   ;+
12865                                   ;       CLR R0.EXT TO R3.EXP
12866                                   ;-
12867
12868  044544                           INCR  R0 FROM #0 TO #6 BY #2                                       CLR     R0
12869  044544  005000                                                                                      BR      $52001
12870  044546  000402                                                                           $52002:
12871  044550                                                                                   ADD     #2,R0
12872  044550  062700  000002                                                                  $52001:
12873  044554                                                                                   CMP     R0,#6
12874  044554  020027  000006                                                                  BGT     $52003
12875  044560  003003
12876  044562                            INLINE <CLR R0.EXP(R0)>                                           CLR R0.EXP(R0)
12877  044562  005060  000522
12878  044566                           ENDINC                                                             BR      $52002
12879  044566  000770
12880  044570                                                                                   $52003:
12881
12882  044570                           ;REPEAT OUTER LOOP FOR TEST CASES
12883  044570                           INLINE <$5070:>                                                    $5070:
12884  044570
12885  044570  004737  055520           CALL CLRDSB                     ;CLR DS BUFFERS                   JSR     PC,CLRDSB
12886
12887
12888                                   ;+
12889                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
12890                                   ;-
12891  044574
12892  044574  013700  000542           LET R0 := TSTCAS                                                   MOV     TSTCAS,R0
12893  044600
12894  044600  012037  000560           LET DATA00 := (R0)+             ;SRC1 LENGTH                      MOV     (R0)+,DATA00
12895  044604
12896  044604  012037  000562           LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA             MOV     (R0)+,DATA01
12897  044610
12898  044610  012037  000564           LET DATA02 := (R0)+             ;SRC2 LENGTH                      MOV     (R0)+,DATA02
12899  044614
12900  044614  012037  000566           LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA             MOV     (R0)+,DATA03
12901  044620                           LET DATA04 := (R0)+             ;DEST LENGTH
```

```
12902  044620  012037  000570                                                  MOV     (R0)+,DATA04
12903  044624
12904  044624  012037  000572      LET DATA05 := (R0)+          ;POINTER TO DS.EXP DATA (SUM)
                                                                               MOV     (R0)+,DATA05
12905  044630
12906  044630  012037  000520      LET CC.EXP := (R0)+          ;CC.EXP (SUM)
                                                                               MOV     (R0)+,CC.EXP
12907
12908                               ;+
12909                               ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
12910                               ;-
12911
12912  044634                       LET R5 := #CHRSET                    ;R5 IS OPERAND STACK FOR ROUTINE
12913  044634  012705  061766                                                  MOV     #CHRSET,R5
12914  044640                       CALL PACK IN <#DSBUF1,DATA01,DATA00>  ;SRC1
12915  044640  010546                                                          MOV     R5,-(SP)
12916  044642  013745  000560                                                  MOV     DATA00,-(R5)
12917  044646  013745  000562                                                  MOV     DATA01,-(R5)
12918  044652  012745  062370                                                  MOV     #DSBUF1,-(R5)
12919  044656  004737  055646                                                  JSR     PC,PACK
12920  044662  012605                                                          MOV     (SP)+,R5
12921  044664                       CALL PACK IN <#DSBUF2,DATA03,DATA02>  ;SRC2
12922  044664  010546                                                          MOV     R5,-(SP)
12923  044666  013745  000564                                                  MOV     DATA02,-(R5)
12924  044672  013745  000566                                                  MOV     DATA03,-(R5)
12925  044676  012745  062432                                                  MOV     #DSBUF2,-(R5)
12926  044702  004737  055646                                                  JSR     PC,PACK
12927  044706  012605                                                          MOV     (SP)+,R5
12928  044710                       CALL PACK IN <#DS.EXP,DATA05,DATA04>  ;DEST
12929  044710  010546                                                          MOV     R5,-(SP)
12930  044712  013745  000570                                                  MOV     DATA04,-(R5)
12931  044716  013745  000572                                                  MOV     DATA05,-(R5)
12932  044722  012745  062536                                                  MOV     #DS.EXP,-(R5)
12933  044726  004737  055646                                                  JSR     PC,PACK
12934  044732  012605                                                          MOV     (SP)+,R5
12935
12936                               ;+
12937                               ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
12938                               ;-
12939
12940  044734                       LET R0 := DATA00 SET.BY #60000
12941  044734  013700  000560                                                  MOV     DATA00,R0
12942  044740  052700  060000                                                  BIS     #60000,R0
12943  044744                       LET R1 := #DSBUF1
12944  044744  012701  062370                                                  MOV     #DSBUF1,R1
12945  044750                       LET R2 := DATA02 SET.BY #60000
12946  044750  013702  000564                                                  MOV     DATA02,R2
12947  044754  052702  060000                                                  BIS     #60000,R2
12948  044760                       LET R3 := #DSBUF2
12949  044760  012703  062432                                                  MOV     #DSBUF2,R3
12950  044764                       LET R4 :- DATA04 SET.BY #60000
12951  044764  013704  000570                                                  MOV     DATA04,R4
12952  044770  052704  060000                                                  BIS     #60000,R4
12953  044774                       LET R5 :- #DS.DST
12954  044774  012705  062474                                                  MOV     #DS.DST,R5
12955
12956                               ;+
12957                               ;       FINISH SET UP & DO CIS INSTRUCTION
```

```
12958                                   ;-
12959
12960
12961  045000                           LET R4.EXP := R4                                        MOV     R4,R4.EXP
12962  045000  010437  000532           LET R5.EXP := R5                                        MOV     R5,R5.EXP
12963  045004
12964  045004  010537  000534           INLINE <ADDP>                                           ADDP
12965  045010
12966  045010  076070
12967
12968                                   ;+
12969                                   ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
12970                                   ;-
12971
12972  045012                           LET CC := PSW                                           MOV     PSW,CC
12973  045012  013737  177776  000516
12974  045020                           LET CC := CC CLR.BY #177760                             BIC     #177760,CC
12975  045020  042737  177760  000516
12976  045026                           IF CC NE CC.EXP THEN                                    CMP     CC,CC.EXP
12977  045026  023737  000516  000520                                                           BEQ     $52004
12978  045034  001402
12979  045036                             CALL ERROR                                            JSR     PC,ERROR
12980  045036  004737  056274
12981  045042                           ENDIF                                           $52004:
12982  045042
12983  045042                           IF R0 NE R0.EXP THEN                                    CMP     R0,R0.EXP
12984  045042  020037  000522                                                                   BEQ     $52005
12985  045046  001402
12986  045050                             CALL ERROR                                            JSR     PC,ERROR
12987  045050  004737  056274
12988  045054                           ENDIF                                           $52005:
12989  045054
12990  045054                           IF R1 NE R1.EXP THEN                                    CMP     R1,R1.EXP
12991  045054  020137  000524                                                                   BEQ     $52006
12992  045060  001402
12993  045062                             CALL ERROR                                            JSR     PC,ERROR
12994  045062  004737  056274
12995  045066                           ENDIF                                           $52006:
12996  045066
12997  045066                           IF R2 NE R2.EXP THEN                                    CMP     R2,R2.EXP
12998  045066  020237  000526                                                                   BEQ     $52007
12999  045072  001402
13000  045074                             CALL ERROR                                            JSR     PC,ERROR
13001  045074  004737  056274
13002  045100                           ENDIF                                           $52007:
13003  045100
13004  045100                           IF R3 NE R3.EXP THEN                                    CMP     R3,R3.EXP
13005  045100  020337  000530                                                                   BEQ     $52010
13006  045104  001402
13007  045106                             CALL ERROR                                            JSR     PC,ERROR
13008  045106  004737  056274
13009  045112                           ENDIF                                           $52010:
13010  045112
13011  045112                           IF R4 NE R4.EXP THEN                                    CMP     R4,R4.EXP
13012  045112  020437  000532                                                                   BEQ     $52011
13013  045116  001402
```

```
13014  045120
13015  045120  004737  056274                    CALL ERROR                                      JSR     PC,ERROR
13016  045124                                    ENDIF
13017  045124                                                                                $52011:
13018  045124                                    IF R5 NE R5.EXP THEN                            CMP     R5,R5.EXP
13019  045124  020537  000534                                                                  BEQ     $52012
13020  045130  001402
13021  045132                                      CALL ERROR                                    JSR     PC,ERROR
13022  045132  004737  056274
13023  045136                                    ENDIF                                       $52012:
13024  045136
13025
13026                                            ;+
13027                                            ;       CHECK RESULTS VS EXPECTED RESULTS
13028                                            ;-
13029
13030  045136                                    LET R0 := #DS.DST                               MOV     #DS.DST,R0
13031  045136  012700  062474
13032  045142                                    LET R1 := #DS.EXP                               MOV     #DS.EXP,R1
13033  045142  012701  062536
13034  045146                                    LET ERRFLG := #0                                CLR     ERRFLG
13035  045146  005037  000454
13036  045152                                    WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO   $52013:
13037  045152                                                                                    CMP     R0,#DS.DST+40
13038  045152  020027  062534                                                                  BEQ     $52014
13039  045156  001410                                                                          TST     ERRFLG
13040  045160  005737  000454                                                                  BNE     $52014
13041  045164  001005
13042  045166                                     IFB (R0)+ NE (R1)+ THEN                      CMPB    (R0)+,(R1)+
13043  045166  122021                                                                         BEQ     $52015
13044  045170  001402
13045  045172                                      CALL ERROR                                    JSR     PC,ERROR
13046  045172  004737  056274
13047  045176                                     ENDIF                                       $52015:
13048  045176
13049  045176                                    ENDDO                                           BR      $52013
13050  045176  000765                                                                       $52014:
13051  045200
13052  045200                                    LET TSTCAS := TSTCAS + #22                       ADD     #22,TSTCAS
13053  045200  062737  000022  000542
13054  045206                                    LET COUNT := COUNT - #1                          DEC     COUNT
13055  045206  005337  000466
13056                                           ;UNTIL COUNT EQ #0
13057  045212                                    IF COUNT NE #0 THEN                              TST     COUNT
13058  045212  005737  000466                                                                  BEQ     $52016
13059  045216  001402
13060  045220                                     INLINE <JMP $5070>                            JMP $5070
13061  045220  000137  044570
13062  045224                                    ENDIF                                       $52016:
13063  045224
13064
13065                                            ;+
13066                                            ;       INLINE CASE - ADDPI, USING UNSIGNED PACKED DATA
13067                                            ;-
13068
13069  045224                                    CALL CLRDSB
```

```
13070  045224  004737  055520                                                    JSR     PC,CLRDSB
13071
13072                                  ;+
13073                                  ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
13074                                  ;-
13075
13076  045230                          LET R0 := #TADD+2
13077  045230  012700  063202                                                    MOV     #TADD+2,R0
13078  045234                          LET DATA00 := (R0)+             ;SRC1 LENGTH
13079  045234  012037  000560                                                    MOV     (R0)+,DATA00
13080  045240                          LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA
13081  045240  012037  000562                                                    MOV     (R0)+,DATA01
13082  045244                          LET DATA02 := (R0)+             ;SRC2 LENGTH
13083  045244  012037  000564                                                    MOV     (R0)+,DATA02
13084  045250                          LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA
13085  045250  012037  000566                                                    MOV     (R0)+,DATA03
13086  045254                          LET DATA04 := (R0)+             ;DEST LENGTH
13087  045254  012037  000570                                                    MOV     (R0)+,DATA04
13088  045260                          LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
13089  045260  012037  000572                                                    MOV     (R0)+,DATA05
13090
13091                                  ;+
13092                                  ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
13093                                  ;-
13094
13095  045264                          LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
13096  045264  012705  061766                                                    MOV     #CHRSET,R5
13097  045270                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
13098  045270  010546                                                            MOV     R5,-(SP)
13099  045272  013745  000560                                                    MOV     DATA00,-(R5)
13100  045276  013745  000562                                                    MOV     DATA01,-(R5)
13101  045302  012745  062370                                                    MOV     #DSBUF1,-(R5)
13102  045306  004737  055646                                                    JSR     PC,PACK
13103  045312  012605                                                            MOV     (SP)+,R5
13104  045314                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
13105  045314  010546                                                            MOV     R5,-(SP)
13106  045316  013745  000564                                                    MOV     DATA02,-(R5)
13107  045322  013745  000566                                                    MOV     DATA03,-(R5)
13108  045326  012745  062432                                                    MOV     #DSBUF2,-(R5)
13109  045332  004737  055646                                                    JSR     PC,PACK
13110  045336  012605                                                            MOV     (SP)+,R5
13111  045340                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
13112  045340  010546                                                            MOV     R5,-(SP)
13113  045342  013745  000570                                                    MOV     DATA04,-(R5)
13114  045346  013745  000572                                                    MOV     DATA05,-(R5)
13115  045352  012745  062536                                                    MOV     #DS.EXP,-(R5)
13116  045356  004737  055646                                                    JSR     PC,PACK
13117  045362  012605                                                            MOV     (SP)+,R5
13118
13119  045364                          CALL CLRREG                     ;ENSURE GPR'S 0-5 ARE ZERO
13120  045364  004737  055330                                                    JSR     PC,CLRREG
13121
13122
13123  045370                          INLINE <ADDPI>
13124  045370  076170                                                    ADDPI
13125  045372                          INLINE <.WORD TADDPI>
```

```
13126  045372  064066                          INLINE <.WORD TADDPI+4>                                    .WORD   TADDPI
13127  045374                                  INLINE <.WORD TADDPI+10>                                   .WORD   TADDPI+4
13128  045374  064072                          LET CC := PSW                                              .WORD   TADDPI+10
13129  045376                                  LET CC := CC CLR.BY #177760                                MOV     PSW,CC
13130  045376  064076                          IF CC NE #0 THEN                                           BIC     #177760,CC
13131  045400                                                                                             TST     CC
13132  045400  013737  177776  000516           CALL ERROR                                                BEQ     $52017
13133  045406                                  ENDIF                                                      JSR     PC,ERROR
13134  045406  042737  177760  000516
13135  045414                                                                                  $52017:
13136  045414  005737  000516                  ;+
13137  045420  001402                          ;       ENSURE GPR'S STILL ZERO
13138  045422                                  ;-
13139  045422  004737  056274                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN                   TST     R0
13140  045426                                                                                             BNE     $52020
13141  045426                                                                                             TST     R1
13142                                                                                                      BNE     $52020
13143                                                                                                      TST     R2
13144                                                                                                      BEQ     $52021
13145                                                                                           $52020:
13146                                           CALL ERROR                                                JSR     PC,ERROR
13147  045426                                  ENDIF
13148  045426  005700                                                                           $52021:
13149  045430  001004                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN                  TST     R3
13150  045432  005701                                                                                     BNE     $52022
13151  045434  001002                                                                                     TST     R4
13152  045436  005702                                                                                     BNE     $52022
13153  045440  001402                                                                                     TST     R5
13154  045442                                                                                             BEQ     $52023
13155  045442                                                                                  $52022:
13156  045442  004737  056274                   CALL ERROR                                                JSR     PC,ERROR
13157  045446                                  ENDIF
13158  045446                                                                                  $52023:
13159  045446                                  ;+
13160  045446  005703                          ;       CHECK RESULTS
13161  045450  001004                          ;-
13162  045452  005704                          LET R0 := #DS.DST                                          MOV     #DS.DST,R0
13163  045454  001002                          LET R1 := #DS.EXP                   ;EXPECTED DATA         MOV     #DS.EXP,R1
13164  045456  005705                          LET R2 := TADDPI+10 CLR.BY #70000;GET STRING LENGTH        MOV     TADDPI+10,R2
13165  045460  001402
13166  045462
13167  045462
13168  045462  004737  056274
13169  045466
13170  045466
13171
13172
13173
13174
13175
13176  045466
13177  045466  012700  062474
13178  045472
13179  045472  012701  062536
13180  045476
13181  045476  013702  064076
```

ADDP

SEQ 0269

```
13182  045502  042702  070000                  INLINE  <ASR    R2>             ;LENGTH/2 (PACKING FACTOR)
13183  045506                                  LET R2 := R2 + #DS.EXP          ;R2 POINTS TO MSD/SIGN
13184  045506  006202                          LET (R2) :B= (R2) SET.BY #17    ;MAKE IT UNSIGNED
13185  045510                                  LET ERRFLG := #0
13186  045510  062702  062536                  WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
13187  045514
13188  045514  152712  000017                   IFB (R0)+ NE (R1)+ THEN
13189  045520
13190  045520  005037  000454                    CALL ERROR
13191  045524                                   ENDIF
13192  045524                                  ENDDO
13193  045524  020027  062533
13194  045530  001410
13195  045532  005737  000454
13196  045536  001005
13197  045540
13198  045540  122021
13199  045542  001402
13200  045544
13201  045544  004737  056274
13202  045550
13203  045550
13204  045550
13205  045550  000765
13206  045552
13207
13208
```

```
        BIC     #70000,R2
        ASR     R2
        ADD     #DS.EXP,R2
        BISB    #17,(R2)
        CLR     ERRFLG
$52024:
        CMP     R0,#DS.DST+37
        BEQ     $52025
        TST     ERRFLG
        BNE     $52025
        CMPB    (R0)+,(R1)+
        BEQ     $52026
        JSR     PC,ERROR
$52026:
        BR      $52024
$52025:
```

```
13209                                   .SBTTL  SUBP
13210                                   ;*****************************************************************
13211                                   ;
13212                                   ;       SUBP TEST
13213                                   ;
13214                                   ;*****************************************************************
13215
13216  045552                           INLINE <XSUBP:>
13217  045552                                                                          XSUBP:
13218  045552                           INLINE <SCOPE>
13219  045552  000004                                                                  SCOPE
13220  045554                           LET $TIMES := #20              ;ITERATION COUNT
13221  045554  012737  000020  000404                                                 MOV     #20,$TIMES
13222  045562                           LET COUNT := TADD              ;# OF TEST CASES
13223  045562  013737  063200  000466                                                 MOV     TADD,COUNT
13224  045570                           LET TSTCAS := #TADD+2          ;POINT TO FIRST TEST CASE
13225  045570  012737  063202  000542                                                 MOV     #TADD+2,TSTCAS
13226
13227                                   ;+
13228                                   ;       CLR R0.EXT TO R3.EXP
13229                                   ;-
13230
13231  045576                           INCR  R0 FROM #0 TO #6 BY #2
13232  045576  005000                                                                 CLR     R0
13233  045600  000402                                                                 BR      $52027
13234  045602                                                                  $52030:
13235  045602  062700  000002                                                         ADD     #2,R0
13236  045606                                                                  $52027:
13237  045606  020027  000006                                                         CMP     R0,#6
13238  045612  003003                                                                 BGT     $52031
13239  045614
13240  045614  005060  000522           INLINE <CLR R0.EXP(R0)>                       CLR R0.EXP(R0)
13241  045620
13242  045620  000770                   ENDINC                                        BR      $52030
13243  045622                                                                  $52031:
13244
13245  045622                           ;REPEAT OUTER LOOP FOR TEST CASES
13246  045622                           INLINE <$5071:>
13247  045622                                                                  $5071:
13248  045622  004737  055520           CALL CLRDSB                    ;CLR DS BUFFERS JSR     PC,CLRDSB
13249
13250                                   ;+
13251                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
13252                                   ;-
13253
13254  045626                           LET R0 := TSTCAS
13255  045626  013700  000542                                                         MOV     TSTCAS,R0
13256  045632                           LET DATA00 := (R0)+            ;SRC1 LENGTH
13257  045632  012037  000560                                                         MOV     (R0)+,DATA00
13258  045636                           LET DATA01 := (R0)+            ;POINTER TO SRC1 DATA
13259  045636  012037  000562                                                         MOV     (R0)+,DATA01
13260  045642                           LET DATA02 := (R0)+            ;SRC2 LENGTH
13261  045642  012037  000564                                                         MOV     (R0)+,DATA02
13262  045646                           LET DATA03 := (R0)+            ;POINTER TO SRC2 DATA
13263  045646  012037  000566                                                         MOV     (R0)+,DATA03
13264  045652                           LET DATA04 := (R0)+            ;DEST LENGTH
```

```
13265  045652  012037  000570                                                          MOV     (R0)+,DATA04
13266  045656
13267  045656  012037  000572                                                          MOV     (R0)+,DATA05
13268  045662
13269  045662  012037  000520                                                          MOV     (R0)+,CC.EXP
13270  045666
13271  045666  012037  000572                                                          MOV     (R0)+,DATA05
13272  045672
13273  045672  012037  000520                                                          MOV     (R0)+,CC.EXP
13274
13275                                  ;+
13276                                  ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
13277                                  ;-
13278
13279  045676                          LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
13280  045676  012705  061766                                                          MOV     #CHRSET,R5
13281  045702                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
13282  045702  010546                                                          MOV     R5,-(SP)
13283  045704  013745  000560                                                          MOV     DATA00,-(R5)
13284  045710  013745  000562                                                          MOV     DATA01,-(R5)
13285  045714  012745  062370                                                          MOV     #DSBUF1,-(R5)
13286  045720  004737  055646                                                          JSR     PC,PACK
13287  045724  012605                                                                  MOV     (SP)+,R5
13288  045726                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
13289  045726  010546                                                          MOV     R5,-(SP)
13290  045730  013745  000564                                                          MOV     DATA02,-(R5)
13291  045734  013745  000566                                                          MOV     DATA03,-(R5)
13292  045740  012745  062432                                                          MOV     #DSBUF2,-(R5)
13293  045744  004737  055646                                                          JSR     PC,PACK
13294  045750  012605                                                                  MOV     (SP)+,R5
13295  045752                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
13296  045752  010546                                                          MOV     R5,-(SP)
13297  045754  013745  000570                                                          MOV     DATA04,-(R5)
13298  045760  013745  000572                                                          MOV     DATA05,-(R5)
13299  045764  012745  062536                                                          MOV     #DS.EXP,-(R5)
13300  045770  004737  055646                                                          JSR     PC,PACK
13301  045774  012605                                                                  MOV     (SP)+,R5
13302
13303
13304                                  ;+
13305                                  ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
13306                                  ;-
13307
13308  045776                          LET R0 := DATA00 SET.BY #60000
13309  045776  013700  000560                                                          MOV     DATA00,R0
13310  046002  052700  060000                                                          BIS     #60000,R0
13311  046006                          LET R1 := #DSBUF1
13312  046006  012701  062370                                                          MOV     #DSBUF1,R1
13313  046012                          LET R2 := DATA02 SET.BY #60000
13314  046012  013702  000564                                                          MOV     DATA02,R2
13315  046016  052702  060000                                                          BIS     #60000,R2
13316  046022                          LET R3 := #DSBUF2
13317  046022  012703  062432                                                          MOV     #DSBUF2,R3
13318  046026                          LET R4 := DATA04 SET.BY #60000
13319  046026  013704  000570                                                          MOV     DATA04,R4
13320  046032  052704  060000                                                          BIS     #60000,R4
```

```
13321  046036
13322  046036  012705  062474                  LET R5 := #DS.DST                                   MOV     #DS.DST,R5
13323
13324                                           ;+
13325                                           ;       FINISH SET UP & DO CIS INSTRUCTION
13326                                           ;-
13327
13328
13329  046042
13330  046042  010437  000532                  LET R4.EXP := R4                                    MOV     R4,R4.EXP
13331  046046
13332  046046  010537  000534                  LET R5.EXP := R5                                    MOV     R5,R5.EXP
13333  046052
13334  046052  076071                          INLINE <SUBP>                                       SUBP
13335
13336                                           ;+
13337                                           ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
13338                                           ;-
13339
13340  046054
13341  046054  013737  177776  000516           LET CC := PSW                                       MOV     PSW,CC
13342  046062
13343  046062  042737  177760  000516           LET CC := CC CLR.BY #177760                         BIC     #177760,CC
13344  046070
13345  046070  023737  000516  000520           IF CC NE CC.EXP THEN                                CMP     CC,CC.EXP
13346  046076  001402                                                                              BEQ     $52032
13347  046100
13348  046100  004737  056274                     CALL ERROR                                       JSR     PC,ERROR
13349  046104
13350  046104                                   ENDIF                                           $52032:
13351  046104
13352  046104  020037  000522                  IF R0 NE R0.EXP THEN                                CMP     R0,R0.EXP
13353  046110  001402                                                                              BEQ     $52033
13354  046112
13355  046112  004737  056274                     CALL ERROR                                       JSR     PC,ERROR
13356  046116
13357  046116                                   ENDIF                                           $52033:
13358  046116
13359  046116  020137  000524                  IF R1 NE R1.EXP THEN                                CMP     R1,R1.EXP
13360  046122  001402                                                                              BEQ     $52034
13361  046124
13362  046124  004737  056274                     CALL ERROR                                       JSR     PC,ERROR
13363  046130
13364  046130                                   ENDIF                                           $52034:
13365  046130
13366  046130  020237  000526                  IF R2 NE R2.EXP THEN                                CMP     R2,R2.EXP
13367  046134  001402                                                                              BEQ     $52035
13368  046136
13369  046136  004737  056274                     CALL ERROR                                       JSR     PC,ERROR
13370  046142
13371  046142                                   ENDIF                                           $52035:
13372  046142
13373  046142  020337  000530                  IF R3 NE R3.EXP THEN                                CMP     R3,R3.EXP
13374  046146  001402                                                                              BEQ     $52036
13375  046150
13376  046150  004737  056274                     CALL ERROR                                       JSR     PC,ERROR
```

```
13377  046154                          ENDIF
13378  046154                                                          $52036:
13379  046154                          IF R4 NE R4.EXP THEN
13380  046154  020437  000532                                                  CMP     R4,R4.EXP
13381  046160  001402                                                          BEQ     $52037
13382  046162                            CALL ERROR
13383  046162  004737  056274                                                  JSR     PC,ERROR
13384  046166                          ENDIF
13385  046166                                                          $52037:
13386  046166                          IF R5 NE R5.EXP THEN
13387  046166  020537  000534                                                  CMP     R5,R5.EXP
13388  046172  001402                                                          BEQ     $52040
13389  046174                            CALL ERROR
13390  046174  004737  056274                                                  JSR     PC,ERROR
13391  046200                          ENDIF
13392  046200                                                          $52040:
13393
13394
13395                                   ;+
13396                                   ;       CHECK RESULTS VS EXPECTED RESULTS
13397                                   ;-
13398
13399  046200                          LET R0 := #DS.DST
13400  046200  012700  062474                                                  MOV     #DS.DST,R0
13401  046204                          LET R1 := #DS.EXP
13402  046204  012701  062536                                                  MOV     #DS.EXP,R1
13403  046210                          LET ERRFLG := #0
13404  046210  005037  000454                                                  CLR     ERRFLG
13405  046214                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
13406  046214                                                          $52041:
13407  046214  020027  062534                                                  CMP     R0,#DS.DST+40
13408  046220  001410                                                          BEQ     $52042
13409  046222  005737  000454                                                  TST     ERRFLG
13410  046226  001005                                                          BNE     $52042
13411  046230                            IFB (R0)+ NE (R1)+ THEN
13412  046230  122021                                                          CMPB    (R0)+,(R1)+
13413  046232  001402                                                          BEQ     $52043
13414  046234                              CALL ERROR
13415  046234  004737  056274                                                  JSR     PC,ERROR
13416  046240                            ENDIF
13417  046240                                                          $52043:
13418  046240                          ENDDO
13419  046240  000765                                                          BR      $52041
13420  046242                                                          $52042:
13421  046242                          LET TSTCAS := TSTCAS + #22
13422  046242  062737   00022  000542                                          ADD     #22,TSTCAS
13423  046250                          LET COUNT := COUNT - #1
13424  046250  005337  000466                                                  DEC     COUNT
13425                                  ;UNTIL COUNT EQ #0
13426  046254                          IF COUNT NE #0 THEN
13427  046254  005737  000466                                                  TST     COUNT
13428  046260  001402                                                          BEQ     $52044
13429  046262                            INLINE <JMP $5071>
13430  046262  000137  045622                                                  JMP $5071
13431  046266                          ENDIF
13432  046266                                                          $52044:
```

```
13433
13434                                   ;+
13435                                   ;       INLINE CASE - SUBPI, USING UNSIGNED PACKED DATA
13436                                   ;-
13437
13438  046266                           CALL CLRDSB
13439  046266  004737  055520                                                          JSR     PC,CLRDSB
13440
13441                                   ;+
13442                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
13443                                   ;-
13444
13445  046272                           LET R0 := #TADD+2
13446  046272  012700  063202                                                          MOV     #TADD+2,R0
13447  046276                           LET DATA00 := (R0)+             ;SRC1 LENGTH
13448  046276  012037  000560                                                          MOV     (R0)+,DATA00
13449  046302                           LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA
13450  046302  012037  000562                                                          MOV     (R0)+,DATA01
13451  046306                           LET DATA02 := (R0)+             ;SRC2 LENGTH
13452  046306  012037  000564                                                          MOV     (R0)+,DATA02
13453  046312                           LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA
13454  046312  012037  000566                                                          MOV     (R0)+,DATA03
13455  046316                           LET DATA04 := (R0)+             ;DEST LENGTH
13456  046316  012037  000570                                                          MOV     (R0)+,DATA04
13457  046322                           LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (SUM)
13458  046322  012037  000572                                                          MOV     (R0)+,DATA05
13459  046326                           LET CC.EXP := (R0)+
13460  046326  012037  000520                                                          MOV     (R0)+,CC.EXP
13461  046332                           LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (DIFFERENCE)
13462  046332  012037  000572                                                          MOV     (R0)+,DATA05
13463
13464                                   ;+
13465                                   ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
13466                                   ;-
13467
13468  046336                           LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
13469  046336  012705  061766                                                          MOV     #CHRSET,R5
13470  046342                           CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
13471  046342  010546                                                          MOV     R5,-(SP)
13472  046344  013745  000560                                                  MOV     DATA00,-(R5)
13473  046350  013745  000562                                                  MOV     DATA01,-(R5)
13474  046354  012745  062370                                                  MOV     #DSBUF1,-(R5)
13475  046360  004737  055646                                                  JSR     PC,PACK
13476  046364  012605                                                          MOV     (SP)+,R5
13477  046366                           CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
13478  046366  010546                                                          MOV     R5,-(SP)
13479  046370  013745  000564                                                  MOV     DATA02,-(R5)
13480  046374  013745  000566                                                  MOV     DATA03,-(R5)
13481  046400  012745  062432                                                  MOV     #DSBUF2,-(R5)
13482  046404  004737  055646                                                  JSR     PC,PACK
13483  046410  012605                                                          MOV     (SP)+,R5
13484  046412                           CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
13485  046412  010546                                                          MOV     R5,-(SP)
13486  046414  013745  000570                                                  MOV     DATA04,-(R5)
13487  046420  013745  000572                                                  MOV     DATA05,-(R5)
13488  046424  012745  062536                                                  MOV     #DS.EXP,-(R5)
```

```
13489  046430  004737  055646                                                          JSR     PC,PACK
13490  046434  012605                                                                  MOV     (SP)+,R5
13491  046436
13492  046436  004737  055330          CALL CLRREG                ;ENSURE GPR'S 0-5 ARE ZERO
                                                                                       JSR     PC,CLRREG
13493  046442
13494  046442  076171                  INLINE <SUBPI>                                 SUBPI
13495  046444
13496  046444  064066                  INLINE <.WORD TADDPI>                          .WORD   TADDPI
13497  046446
13498  046446  064072                  INLINE <.WORD TADDPI+4>                        .WORD   TADDPI+4
13499  046450
13500  046450  064076                  INLINE <.WORD TADDPI+10>                       .WORD   TADDPI+10
13501  046452
13502  046452  013737  177776  000516  LET CC := PSW                                 MOV     PSW,CC
13503  046460
13504  046460  042737  177760  000516  LET CC := CC CLR.BY #177760                   BIC     #177760,CC
13505  046466
13506  046466  005737  000516          IF CC NE #0 THEN                               TST     CC
13507  046472  001402                                                                  BEQ     $52045
13508  046474
13509  046474  004737  056274          CALL ERROR                                     JSR     PC,ERROR
13510  046500                          ENDIF
13511  046500                                                                $52045:
13512
13513                                  ;+
13514                                  ;       ENSURE GPR'S STILL ZERO
13515                                  ;-
13516
13517  046500                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
13518  046500  005700                                                                  TST     R0
13519  046502  001004                                                                  BNE     $52046
13520  046504  005701                                                                  TST     R1
13521  046506  001002                                                                  BNE     $52046
13522  046510  005702                                                                  TST     R2
13523  046512  001402                                                                  BEQ     $52047
13524  046514                                                                $52046:
13525  046514                          CALL ERROR
13526  046514  004737  056274                                                          JSR     PC,ERROR
13527  046520                          ENDIF
13528  046520                                                                $52047:
13529  046520                          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
13530  046520  005703                                                                  TST     R3
13531  046522  001004                                                                  BNE     $52050
13532  046524  005704                                                                  TST     R4
13533  046526  001002                                                                  BNE     $52050
13534  046530  005705                                                                  TST     R5
13535  046532  001402                                                                  BEQ     $52051
13536  046534                                                                $52050:
13537  046534                          CALL ERROR
13538  046534  004737  056274                                                          JSR     PC,ERROR
13539  046540                          ENDIF
13540  046540                                                                $52051:
13541
13542                                  ;+
13543                                  ;       CHECK RESULTS
13544                                  ;-
```

```
13545
13546  046540
13547  046540  012700  062474          LET R0 := #DS.DST                                       MOV     #DS.DST,R0
13548  046544
13549  046544  012701  062536          LET R1 := #DS.EXP               ;EXPECTED DATA          MOV     #DS.EXP,R1
13550  046550
13551  046550  013702  064076          LET R2 := TADDPI+10 CLR.BY #70000       ;GET STRING LENGTH
13552  046554  042702  070000                                                                  MOV     TADDPI+10,R2
13553  046560                                                                                  BIC     #70000,R2
13554  046560  006202          INLINE  <ASR    R2>             ;LENGTH/2 (PACKING FACTOR)
13555  046562                                                                                  ASR     R2
13556  046562  062702  062536          LET R2 := R2 + #DS.EXP          ;R2 POINTS TO MSD/SIGN  ADD     #DS.EXP,R2
13557  046566
13558  046566  152712  000017          LET (R2) :B= (R2) SET.BY #17    ;MAKE IT UNSIGNED       BISB    #17,(R2)
13559  046572
13560  046572  005037  000454          LET ERRFLG := #0                                        CLR     ERRFLG
13561  046576
13562  046576                          WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
13563  046576  020027  062533                                                          $52052:
13564  046602  001410                                                                          CMP     R0,#DS.DST+37
13565  046604  005737  000454                                                                  BEQ     $52053
13566  046610  001005                                                                          TST     ERRFLG
13567  046612                                                                                  BNE     $52053
13568  046612  122021           IFB (R0)+ NE (R1)+ THEN
13569  046614  001402                                                                          CMPB    (R0)+,(R1)+
13570  046616                                                                                  BEQ     $52054
13571  046616  004737  056274            CALL ERROR                                            JSR     PC,ERROR
13572  046622
13573  046622           ENDIF                                                          $52054:
13574  046622
13575  046622  000765          ENDDO                                                           BR      $52052
13576  046624                                                                          $52053:
13577
13578
```

```
13579                                   .SBTTL  CMPP
13580                                   ;*****************************************************************
13581                                   ;
13582                                   ;  CMPP TEST
13583                                   ;
13584                                   ;*****************************************************************
13585
13586  046624                           INLINE <XCMPP:>
13587  046624                                                                          XCMPP:
13588  046624                           INLINE <SCOPE>
13589  046624  000004                                                                  SCOPE
13590  046626                           LET $TIMES := #20              ;ITERATION COUNT
13591  046626  012737  000020  000404                                                 MOV     #20,$TIMES
13592  046634                           LET COUNT := TCMP              ;GET TEST COUNT
13593  046634  013737  062576  000466                                                 MOV     TCMP,COUNT
13594  046642                           LET TSTCAS := #TCMP+2          ;POINT TO FIRST TEST CASE
13595  046642  012737  062600  000542                                                 MOV     #TCMP+2,TSTCAS
13596                                   ;REPEAT
13597  046650                           INLINE <$5072:>
13598  046650                                                                          $5072:
13599  046650                              CALL CLRDSB
13600  046650  004737  055520                                                        JSR     PC,CLRDSB
13601  046654                              LET CC.EXP := #0
13602  046654  005037  000520                                                        CLR     CC.EXP
13603  046660                              LET SIGNO := #0
13604  046660  005037  000446                                                        CLR     SIGNO
13605  046664                              LET DATTYP := #0
13606  046664  005037  000462                                                        CLR     DATTYP
13607
13608                                      ;+
13609                                   ; GET SOURCE DESCRIPTORS FROM TABLE
13610                                   ;-
13611
13612  046670                           LET R0 := TSTCAS
13613  046670  013700  000542                                                        MOV     TSTCAS,R0
13614  046674                           LET DATA00 := (R0)+            ;SRC1 LENGTH
13615  046674  012037  000560                                                        MOV     (R0)+,DATA00
13616  046700                           LET DATA01 := (R0)+            ;SRC1 POINTER
13617  046700  012037  000562                                                        MOV     (R0)+,DATA01
13618  046704                           LET DATA02 := (R0)+            ;SRC2 LENGTH
13619  046710  012037  000564                                                        MOV     (R0)+,DATA02
13620  046710                           LET DATA03 := (R0)             ;SRC2 POINTER
13621  046710  011037  000566                                                        MOV     (R0),DATA03
13622
13623                                      ;+
13624                                   ; LOAD SRC1 AND SRC2 INTO DSBUF1 AND DSBUF2
13625                                   ; IN NON-PACKED FORMAT, FOR NOW.
13626                                   ;-
13627
13628  046714                           LET R2 := DATA01 + #2          ;GET SRC1 ADDRESS
13629  046714  013702  000562                                                        MOV     DATA01,R2
13630  046720  062702  000002                                                        ADD     #2,R2
13631  046724                           LET R3 := #DSBUF1
13632  046724  012703  062370                                                        MOV     #DSBUF1,R3
13633  046730                           LET DSTMP0 :B  (R2)            ;SAVE SRC1 MSD
13634  046730  111237  000552                                                        MOVB    (R2),DSTMP0
```

```
13635  046734
13636  046734  013701  000560          DECR R1 FROM DATA00 TO #0 BY #1                                  MOV     DATA00,R1
13637  046740  000401                                                                                   BR      $52055
13638  046742                                                                                        $52056:
13639  046742  005301                                                                                   DEC     R1
13640  046744                                                                                        $52055:
13641  046744  005701                                                                                   TST     R1
13642  046746  002402                                                                                   BLT     $52057
13643  046750
13644  046750  112223                       LET (R3)+ :B= (R2)+                                         MOVB    (R2)+,(R3)+
13645  046752
13646  046752  000773                    ENDDEC                                                         BR      $52056
13647  046754                                                                                        $52057:
13648  046754
13649  046754  114237  000553          LET DSTMP1 :B= -(R2)                ;SAVE SRC1 LSD               MOVB    -(R2),DSTMP1
13650  046760
13651  046760  013702  000566          LET R2 := DATA03 + #2               ;GET SRC2 ADDRESS           MOV     DATA03,R2
13652  046764  062702  000002                                                                           ADD     #2,R2
13653  046770
13654  046770  012703  062432          LET R3 := #DSBUF2                                               MOV     #DSBUF2,R3
13655  046774
13656  046774  111237  000554          LET DSTMP2 :B= (R2)                 ;SAVE SRC2 MSD               MOVB    (R2),DSTMP2
13657  047000
13658  047000  013701  000564          DECR R1 FROM DATA02 TO #0 BY #1                                  MOV     DATA02,R1
13659  047004  000401                                                                                   BR      $52060
13660  047006                                                                                        $52061:
13661  047006  005301                                                                                   DEC     R1
13662  047010                                                                                        $52060:
13663  047010  005701                                                                                   TST     R1
13664  047012  002402                                                                                   BLT     $52062
13665  047014
13666  047014  112223                       LET (R3)+ :B= (R2)+                                         MOVB    (R2)+,(R3)+
13667  047016
13668  047016  000773                    ENDDEC                                                         BR      $52061
13669  047020                                                                                        $52062:
13670  047020
13671  047020  114237  000555          LET DSTMP3 :B= -(R2)                ;SAVE SRC2 LSD               MOVB    -(R2),DSTMP3
13672
13673                                    ;+
13674                                    ; COMPARE SRC1 AND SRC2, AND SET N AND Z BITS
13675                                    ; IN CC.EXP ACCORDINGLY.
13676                                    ;-
13677
13678  047024                            IF DATA00 EQ #0 AND DATA02 EQ #0 THEN       ;SRC1 LENGTH AND SRC2 LENGTH = 0
13679  047024  005737  000560                                                                          TST     DATA00
13680  047030  001007                                                                                  BNE     $52063
13681  047032  005737  000564                                                                          TST     DATA02
13682  047036  001004                                                                                  BNE     $52063
13683  047040
13684  047040  052737  000004  000520          LET CC.EXP := CC.EXP SET.BY #ZBIT                       BIS     #ZBIT,CC.EXP
13685  047046
13686  047046  000424                        ELSE                                                      BR      $52064
13687  047050                                                                                        $52063:
13688  047050
13689  047050  005737  000560                IF DATA00 EQ #0 AND @DATA03 EQ #0 THEN  ;SRC1 LENGTH = 0 AND SRC2 SIGN IS +
13690  047054  001007                                                                                  TST     DATA00
                                                                                                       BNE     $52065
```

```
13691  047056  005777  131504                                                          TST     @DATA03
13692  047062  001004                                                                  BNE     $52065
13693  047064
13694  047064  052737  000010  000520                  LET CC.EXP := CC.EXP SET.BY #NBIT
13695  047072                                                                          BIS     #NBIT,CC.EXP
13696  047072  000412                              ELSE                                BR      $52066
13697  047074                                                                  $52065:
13698  047074                                          IF DATA02 EQ #0 AND @DATA01 EQ #-1 THEN    ;SRC2 LENGTH = 0 & SRC1 SIGN IS -
13699  047074  005737  000564                                                          TST     DATA02
13700  047100  001007                                                                  BNE     $52067
13701  047102  027727  131454  177777                                                CMP     @DATA01,#-1
13702  047110  001003                                                                  BNE     $52067
13703  047112
13704  047112  052737  000010  000520                      LET CC.EXP := CC.EXP SET.BY #NBIT
13705  047120                                                                          BIS     #NBIT,CC.EXP
13706  047120                                          ENDIF                   $52067:
13707  047120                                      ENDIF                       $52066:
13708  047120
13709  047120                                  ENDIF
13710  047120                                                                  $52064:
13711  047120                                  IF DATA00 NE #0 AND DATA02 NE #0 THEN      ;SRC1 LENGTH AND SRC2 LENGTH > 0
13712  047120  005737  000560                                                          TST     DATA00
13713  047124  001520                                                                  BEQ     $52070
13714  047126  005737  000564                                                          TST     DATA02
13715  047132  001515                                                                  BEQ     $52070
13716  047134
13717  047134  027777  131422  131424                  IF @DATA01 NE @DATA03 THEN      ;SRC1 SIGN AND SRC2 SIGN ARE DIFFERENT
13718  047142  001410                                                                  CMP     @DATA01,@DATA03
13719  047144                                                                          BEQ     $52071
13720  047144  027727  131412  177777                    IF @DATA01 EQ #-1 THEN        ;SRC1 SIGN IS -
13721  047152  001003                                                                  CMP     @DATA01,#-1
13722  047154                                                                          BNE     $52072
13723  047154  052737  000010  000520                      LET CC.EXP := CC.EXP SET.BY #NBIT
13724  047162                                                                          BIS     #NBIT,CC.EXP
13725  047162                                        ENDIF                     $52072:
13726  047162                                    ELSE                        ;SRC1 SIGN AND SRC2 SIGN ARE EQUAL
13727  047162  000501                                                                  BR      $52073
13728  047164                                                                  $52071:
13729  047164                                      LET SIGN0 := @DATA01       ;SAVE THE COMMON SIGN
13730  047164  017737  131372  000446                                                MOV     @DATA01,SIGN0
13731  047172                                      IF DATA00 LO DATA02 AND SIGN0 EQ #0 THEN    ;SRC1 LENGTH < SRC2 LENGTH AND SIGNS
13732  047172  023737  000560  000564                                                CMP     DATA00,DATA02
13733  047200  103007                                                                 BHIS    $52074
13734  047202  005737  000446                                                        TST     SIGN0
13735  047206  001004                                                                 BNE     $52074
13736  047210
13737  047210  052737  000010  000520                          LET CC.EXP := CC.EXP SET.BY #NBIT
13738  047216                                                                          BIS     #NBIT,CC.EXP
13739  047216  000413                                      ELSE                        BR      $52075
13740  047220                                                                  $52074:
13741  047220                                          IF DATA00 HI DATA02 AND SIGN0 EQ #-1 THEN    ;SRC1 LENGTH > SRC2 LENGTH AND
13742  047220  023737  000560  000564                                                CMP     DATA00,DATA02
13743  047226  101407                                                                 BLOS    $52076
13744  047230  023727  000446  177777                                                CMP     SIGN0,#-1
13745  047236  001003                                                                 BNE     $52076
13746  047240                                              LET CC.EXP := CC.EXP SET.BY #NBIT
```

```
13747  047240  052737  000010  000520                                                  BIS     #NBIT,CC.EXP
13748  047246                                  ENDIF
13749  047246                                                                      $52076:
13750  047246                              ENDIF
13751  047246                                                                      $52075:
13752  047246                              IF DATA00 EQ DATA02 THEN            ;SRC1 LENGTH AND SRC2 LENGTH ARE EQUAL
13753  047246  023737  000560  000564                                                  CMP     DATA00,DATA02
13754  047254  001044                                                                 BNE     $52077
13755
13756                                       ;+
13757                                       ; COMPARE SRC1 AND SRC2 BYTE BY BYTE
13758                                       ;-
13759
13760  047256                               LET R0 := DATA00                   ;SRC BUFFER LENGTH
13761  047256  013700  000560                                                         MOV     DATA00,R0
13762  047262                               LET R1 := #DSBUF1                  ;SRC1 BUFFER
13763  047262  012701  062370                                                         MOV     #DSBUF1,R1
13764  047266                               LET R2 := #DSBUF2                  ;SRC2 BUFFER
13765  047266  012702  062432                                                         MOV     #DSBUF2,R2
13766  047272                               WHILEB R0 NE #0 AND (R1)+ EQ (R2)+ DO
13767  047272                                                                      $52100:
13768  047272  105700                                                                 TSTB    R0
13769  047274  001404                                                                 BEQ     $52101
13770  047276  022122                                                                 CMP     (R1)+,(R2)+
13771  047300  001002                                                                 BNE     $52101
13772  047302                                  LET R0 := R0 - #1               ;DECREMENT COUNTER
13773  047302  005300                                                                 DEC     R0
13774  047304                               ENDDO
13775  047304  000772                                                                 BR      $52100
13776  047306                                                                      $52101:
13777  047306                              IFB -(R1) NE -(R2) THEN     ;SOURCES WERE NOT =
13778  047306  124142                                                                 CMPB    -(R1),-(R2)
13779  047310  001423                                                                 BEQ     $52102
13780  047312                                  IFB (R1) LO (R2) AND SIGN0 EQ #0 THEN
13781  047312  121112                                                                 CMPB    (R1),(R2)
13782  047314  103007                                                                 BHIS    $52103
13783  047316  005737  000446                                                         TST     SIGN0
13784  047322  001004                                                                 BNE     $52103
13785  047324                                      LET CC.EXP := CC.EXP SET.BY #NBIT
13786  047324  052737  000010  000520                                                 BIS     #NBIT,CC.EXP
13787  047332                                  ELSE
13788  047332  000411                                                                 BR      $52104
13789  047334                                                                      $52103:
13790  047334                                      IFB (R1) HI (R2) AND SIGN0 EQ #-1 THEN
13791  047334  121112                                                                 CMPB    (R1),(R2)
13792  047336  101407                                                                 BLOS    $52105
13793  047340  023727  000446  177777                                                 CMP     SIGN0,#-1
13794  047346  001003                                                                 BNE     $52105
13795  047350                                          LET CC.EXP := CC.EXP SET.BY #NBIT
13796  047350  052737  000010  000520                                                 BIS     #NBIT,CC.EXP
13797  047356                                      ENDIF
13798  047356                                                                      $52105:
13799  047356                                  ENDIF
13800  047356                                                                      $52104:
13801  047356                              ELSE                        ;SOURCES WERE EQUAL
13802  047356  000403                                                                 BR      $52106
```

```
13803  047360                                                                                  $52102:
13804  047360                                LET CC.EXP := CC.EXP SET.BY #ZBIT
13805  047360  052737  000004  000520                                                          BIS     #ZBIT,CC.EXP
13806  047366                            ENDIF
13807  047366                                                                                  $52106:
13808  047366                        ENDIF
13809  047366                                                                                  $52077:
13810  047366                    ENDIF
13811  047366                                                                                  $52073:
13812  047366                ENDIF
13813  047366                                                                                  $52070:
13814
13815                                 ;+
13816                                 ; PERFORM THE CMPP INSTRUCTION WITH THE SIGNED
13817                                 ; PACKED DATA TYPE. (UNSIGNED PACKED WILL BE
13818                                 ; TESTED IN THE INLINE PORTION OF THE TEST).
13819                                 ; CHFCK THE RESULTS AND REPORT ANY ERRORS.
13820                                 ;-
13821
13822  047366                         CALL CLRDSB
13823  047366  004737  055520                                                                 JSR     PC,CLRDSB
13824                                 ;LOAD DSBUF1 WITH SRC1 DECIMAL STRING AND SIGN, IN PACKED FORMAT.
13825  047372                         LET R0 := #DSBUF1
13826  047372  012700  062370                                                                 MOV     #DSBUF1,R0
13827  047376                         LET R1 := DATA01 + #2
13828  047376  013701  000562                                                                 MOV     DATA01,R1
13829  047402  062701  000002                                                                 ADD     #2,R1
13830  047406                         LET R2 := DATA00               ;DECIMAL STRING LENGTH
13831  047406  013702  000560                                                                 MOV     DATA00,R2
13832  047412                         IF R2 EQ #0 THEN               ;LENGTH = 0
13833  047412  005702                                                                         TST     R2
13834  047414  001011                                                                         BNE     $52107
13835  047416                            IF @DATA01 EQ #0 THEN       ;SIGN IS +
13836  047416  005777  131140                                                                 TST     @DATA01
13837  047422  001003                                                                         BNE     $52110
13838  047424                               LET (R0) :B= #14
13839  047424  112710  000014                                                                 MOVB    #14,(R0)
13840  047430                            ELSE                        ;SIGN IS -
13841  047430  000402                                                                         BR      $52111
13842  047432                                                                                  $52110:
13843  047432                               LET (R0) :B= #15
13844  047432  112710  000015                                                                 MOVB    #15,(R0)
13845  047436                            ENDIF
13846  047436                                                                                  $52111:
13847  047436                         ELSE
13848  047436  000434                                                                         BR      $52112
13849  047440                                                                                  $52107:
13850  047440                            IF #BIT00 NOTSETIN R2 THEN  ;LENGTH IS EVEN AND > 0
13851  047440  032702  000001                                                                 BIT     #BIT00,R2
13852  047444  001002                                                                         BNE     $52113
13853  047446                               LET (R0)+ :B= (R1)+      ;MOVE THE EVEN NIBBLE
13854  047446  112120                                                                         MOVB    (R1)+,(R0)+
13855  047450                               LET R2 := R2 - #1        ;DECREMENT COUNTER
13856  047450  005302                                                                         DEC     R2
13857  047452                            ENDIF
13858  047452                                                                                  $52113:
```

```
13859  047452                    WHILE R2 NE #1 DO
13860  047452                                                          $52114:
13861  047452  020227  000001                                                    CMP     R2,#1
13862  047456  001410                                                          BEQ     $52115
13863  047460
13864  047460  112103              LET R3 :B= (R1)+          ;GET A BCD
                                                                              MOVB    (R1)+,R3
13865  047462                      INLINE   <ASH  #4,R3>     ;SHIFT IT TO THE HIGH NIBBLE
13866  047462  072327  000004                                                  ASH  #4,R3
13867  047466                      LET R3 :B= R3 SET.BY (R1)+      ;PUT NEXT BCD INTO LOWER NIBBLE
13868  047466  152103                                                          BISB    (R1)+,R3
13869  047470                      LET (R0)+ :B= R3
13870  047470  110320                                                          MOVB    R3,(R0)+
13871  047472                      LET R2 := R2 - #2         ;DECREMENT  COUNTER
13872  047472  162702  000002                                                  SUB     #2,R2
13873  047476                    ENDDO
13874  047476  000765                                                          BR      $52114
13875  047500                                                          $52115:
13876  047500                    LET R3 :B= (R1)           ;GET LAST BCD
13877  047500  111103                                                          MOVB    (R1),R3
13878  047502                    INLINE   <ASH  #4,R3>
13879  047502  072327  000004                                                  ASH  #4,R3
13880  047506                    IF @DATA01 EQ #0 THEN     ;SIGN IS +
13881  047506  005777  131050                                                  TST     @DATA01
13882  047512  001003                                                          BNE     $52116
13883  047514                      LET R3 :B= R3 SET.BY #14
13884  047514  152703  000014                                                  BISB    #14,R3
13885  047520                    ELSE                      ;SIGN IS -
13886  047520  000402                                                          BR      $52117
13887  047522                                                          $52116:
13888  047522                      LET R3 :B= R3 SET.BY #15
13889  047522  152703  000015                                                  BISB    #15,R3
13890  047526                    ENDIF
13891  047526                                                          $52117:
13892  047526                    LET (R0) :B= R3           ;PUT MSD AND SIGN INTO THE BUFFER
13893  047526  110310                                                          MOVB    R3,(R0)
13894  047530                  ENDIF
13895  047530                                                          $52112:
13896                          ;LOAD DSBUF2 WITH SRC2 DECIMAL STRING AND SIGN, IN PACKED FORMAT.
13897  047530                  LET R0 := #DSBUF2
13898  047530  012700  062432                                                  MOV     #DSBUF2,R0
13899  047534                  LET R1 := DATA03 + #2
13900  047534  013701  000566                                                  MOV     DATA03,R1
13901  047540  062701  000002                                                  ADD     #2,R1
13902  047544                  LET R2 := DATA02          ;DECIMAL STRING LENGTH
13903  047544  013702  000564                                                  MOV     DATA02,R2
13904  047550                  IF R2 EQ #0 THEN          ;LENGTH = 0
13905  047550  005702                                                          TST     R2
13906  047552  001011                                                          BNE     $52120
13907  047554                    IF @DATA03 EQ #0 THEN   ;SIGN IS +
13908  047554  005777  131006                                                  TST     @DATA03
13909  047560  001003                                                          BNE     $52121
13910  047562                      LET (R0) :B= #14
13911  047562  112710  000014                                                  MOVB    #14,(R0)
13912  047566                    ELSE                    ;SIGN IS -
13913  047566  000402                                                          BR      $52122
13914  047570                                                          $52121:
```

```
13915  047570
13916  047570  112710  000015                    LET (R0) :B= #15                                  MOVB    #15,(R0)
13917  047574
13918  047574                                    ENDIF
13919  047574                                                                                      $52122:
13920  047574  000434                          ELSE                                              BR      $52123
13921  047576                                                                                    $52120:
13922  047576
13923  047576  032702  000001                    IF #BIT00 NOTSETIN R2 THEN   ;LENGTH IS EVEN AND > 0
13924  047602  001002                                                                            BIT     #BIT00,R2
13925  047604                                                                                    BNE     $52124
13926  047604  112120                            LET (R0)+ :B= (R1)+          ;MOVE THE EVEN NIBBLE
13927  047606                                                                                    MOVB    (R1)+,(R0)+
13928  047606  005302                            LET R2 := R2 - #1            ;DECREMENT COUNTER
13929  047610                                                                                    DEC     R2
13930  047610                                    ENDIF
13931  047610                                                                                    $52124:
13932  047610                                    WHILE R2 NE #1 DO
13933  047610  020227  000001                                                                    $52125:
13934  047614  001410                                                                            CMP     R2,#1
13935  047616                                                                                    BEQ     $52126
13936  047616  112103                            LET R3 :B= (R1)+             ;GET A BCD
13937  047620                                                                                    MOVB    (R1)+,R3
13938  047620  072327  000004                    INLINE   <ASH  #4,R3>        ;SHIFT IT TO THE HIGH NIBBLE
13939  047624                                                                                    ASH  #4,R3
13940  047624  152103                            LET R3 :B= R3 SET.BY (R1)+       ;PUT NEXT BCD INTO LOWER NIBBLE
13941  047626                                                                                    BISB    (R1)+,R3
13942  047626  110320                            LET (R0)+ :B= R3
13943  047630                                                                                    MOVB    R3,(R0)+
13944  047630  162702  000002                    LET R2 := R2 - #2            ;DECREMENT COUNTER
13945  047634                                                                                    SUB     #2,R2
13946  047634  000765                            ENDDO
13947  047636                                                                                    BR      $52125
13948  047636                                                                                  $52126:
13949  047636  111103                            LET R3 :B= (R1)
13950  047640                                                                                    MOVB    (R1),R3
13951  047640  072327  000004                    INLINE   <ASH  #4,R3>
13952  047644                                                                                    ASH  #4,R3
13953  047644  005777  130716                    IF @DATA03 EQ #0 THEN        ;SIGN IS +
13954  047650  001003                                                                            TST     @DATA03
13955  047652                                                                                    BNE     $52127
13956  047652  152703  000014                      LET R3 :B= R3 SET.BY #14
13957  047656                                                                                    BISB    #14,R3
13958  047656  000402                            ELSE                         ;SIGN IS -
13959  047660                                                                                    BR      $52130
13960  047660                                                                                  $52127:
13961  047660  152703  000015                      LET R3 :B= R3 SET.BY #15
13962  047664                                                                                    BISB    #15,R3
13963  047664                                    ENDIF
13964  047664                                                                                  $52130:
13965  047664  110310                            LET (R0) :B= R3              ;PUT MSD AND SIGN INTO THE BUFFER
13966  047666                                                                                    MOVB    R3,(R0)
13967  047666                                  ENDIF
13968                                                                                          $52123:
13969
13970                                           ;+
                                                ; LOAD THE GPR'S AND DO THE CMPP INSTRUCTION
```

```
13971                                          ;-
13972
13973  047666                                  LET R0 := #60000 SET.BY DATA00  ;SRC1.DSCR
13974  047666  012700  060000                                                  MOV     #60000,R0
13975  047672  053700  000560                                                  BIS     DATA00,R0
13976  047676                                  LET R1 := #DSBUF1               ;  ''
13977  047676  012701  062370                                                  MOV     #DSBUF1,R1
13978  047702                                  LET R2 := #60000 SET.BY DATA02  ;SRC2.DSCR
13979  047702  012702  060000                                                  MOV     #60000,R2
13980  047706  053702  000564                                                  BIS     DATA02,R2
13981  047712                                  LET R3 := #DSBUF2               ;  ''
13982  047712  012703  062432                                                  MOV     #DSBUF2,R3
13983  047716                                  LET R4 := #0
13984  047716  005004                                                          CLR     R4
13985  047720                                  LET R5 := #0
13986  047720  005005                                                          CLR     R5
13987  047722                                  INLINE <CMPP>
13988  047722  076072                                                          CMPP
13989
13990                                          ;+
13991                                          ; CHECK THE RESULTS AND REPORT ANY ERRORS
13992                                          ;-
13993
13994  047724                                  LET CC := PSW
13995  047724  013737  177776  000516                                          MOV     PSW,CC
13996  047732                                  LET CC := CC CLR.BY #177760
13997  047732  042737  177760  000516                                          BIC     #177760,CC
13998  047740                                  IF CC NE CC.EXP THEN
13999  047740  023737  000516  000520                                          CMP     CC,CC.EXP
14000  047746  001402                                                          BEQ     $52131
14001  047750                                      CALL ERROR
14002  047750  004737  056274                                                  JSR     PC,ERROR
14003  047754                                  ENDIF
14004  047754                                                          $52131:
14005  047754                                  IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
14006  047754  005700                                                          TST     R0
14007  047756  001004                                                          BNE     $52132
14008  047760  005701                                                          TST     R1
14009  047762  001002                                                          BNE     $52132
14010  047764  005702                                                          TST     R2
14011  047766  001402                                                          BEQ     $52133
14012  047770                                                          $52132:
14013  047770                                      CALL ERROR
14014  047770  004737  056274                                                  JSR     PC,ERROR
14015  047774                                  ENDIF
14016  047774                                                          $52133:
14017  047774                                  IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
14018  047774  005703                                                          TST     R3
14019  047776  001004                                                          BNE     $52134
14020  050000  005704                                                          TST     R4
14021  050002  001002                                                          BNE     $52134
14022  050004  005705                                                          TST     R5
14023  050006  001402                                                          BEQ     $52135
14024  050010                                                          $52134:
14025  050010                                      CALL ERROR
14026  050010  004737  056274                                                  JSR     PC,ERROR
```

```
14027  050014                          ENDIF
14028  050014                                                                  $52135:
14029  050014
14030  050014  062737  000010  000542  LET TSTCAS := TSTCAS + #10                    ADD     #10,TSTCAS
14031  050022
14032  050022  005337  000466          LET COUNT := COUNT - #1                       DEC     COUNT
14033                                  ;UNTIL COUNT EQ #0
14034  050026                          IF COUNT NE #0 THEN
14035  050026  005737  000466                                                       TST     COUNT
14036  050032  001402                                                               BEQ     $52136
14037  050034
14038  050034  000137  046650          INLINE <JMP $5072>                           JMP $5072
14039  050040                          ENDIF
14040  050040                                                                  $52136:
14041
14042
14043
14044                                  ;+
14045                                  ; DO ONE INLINE CASE - CMPPI.  USE UNSIGNED PACKED DATA TYPE.
14046                                  ;-
14047
14048  050040                          LET R0 := #-1
14049  050040  012700  177777                                                       MOV     #-1,R0
14050  050044                          LET R1 := #-1
14051  050044  012701  177777                                                       MOV     #-1,R1
14052  050050                          LET R2 := #-1
14053  050050  012702  177777                                                       MOV     #-1,R2
14054  050054                          LET R3 := #-1
14055  050054  012703  177777                                                       MOV     #-1,R3
14056  050060                          LET R4 := #-1
14057  050060  012704  177777                                                       MOV     #-1,R4
14058  050064                          LET R5 := #-1
14059  050064  012705  177777                                                       MOV     #-1,R5
14060  050070                          INLINE   <CMPPI>
14061  050070  076172                                                               CMPPI
14062  050072                          INLINE   <.WORD  TCMPPI>
14063  050072  050206                                                               .WORD   TCMPPI
14064  050074                          INLINE   <.WORD  TCMPPI+4>
14065  050074  050212                                                               .WORD   TCMPPI+4
14066  050076                          LET CC := PSW
14067  050076  013737  177776  000516                                               MOV     PSW,CC
14068  050104                          LET CC := CC CLR.BY #177760
14069  050104  042737  177760  000516                                               BIC     #177760,CC
14070  050112                          IF CC NE #4 THEN
14071  050112  023727  000516  000004                                               CMP     CC,#4
14072  050120  001402                                                               BEQ     $52137
14073  050122                             CALL ERROR
14074  050122  004737  056274                                                       JSR     PC,ERROR
14075  050126                          ENDIF
14076  050126                                                                  $52137:
14077  050126                          IF R0 NE #-1 OR R1 NE #-1 OR R2 NE #-1 THEN
14078  050126  020027  177777                                                       CMP     R0,#-1
14079  050132  001006                                                               BNE     $52140
14080  050134  020127  177777                                                       CMP     R1,#-1
14081  050140  001003                                                               BNE     $52140
14082  050142  020227  177777                                                       CMP     R2,#-1
```

```
14083  050146  001402                                                                    BEQ     $52141
14084  050150                                                                  $52140:
14085  050150                          CALL ERROR
14086  050150  004737  056274                                                          JSR     PC,ERROR
14087  050154                          ENDIF
14088  050154                                                                  $52141:
14089  050154                          IF R3 NE #-1 OR R4 NE #-1 OR R5 NE #-1 THEN
14090  050154  020327  177777                                                          CMP     R3,#-1
14091  050160  001006                                                                  BNE     $52142
14092  050162  020427  177777                                                          CMP     R4,#-1
14093  050166  001003                                                                  BNE     $52142
14094  050170  020527  177777                                                          CMP     R5,#-1
14095  050174  001402                                                                  BEQ     $52143
14096  050176                                                                  $52142:
14097  050176                          CALL ERROR
14098  050176  004737  056274                                                          JSR     PC,ERROR
14099  050202                          ENDIF
14100  050202                                                                  $52143:
14101  050202                          INLINE  <JMP XASHP>
14102  050202  000137  050222                                                          JMP XASHP
14103
14104
14105
14106                                   ;+
14107                                   ;INLINE TEST CASE
14108                                   ;-
14109
14110  050206  070005                  TCMPPI: .WORD   070005          ;SRC1 DATA TYPE = UNSIGNED PACKED, LENGTH = 5
14111  050210  050216                          .WORD   CMPPI1          ;SRC1.DSCR
14112  050212  070005                          .WORD   070005          ;SRC2 DATA TYPE = UNSIGNED PACKED, LENGTH = 5
14113  050214  050216                          .WORD   CMPPI1          ;SRC2.DSCR
14114
14115  050216     022     064     137  CMPPI1: .BYTE   022,064,137     ;PACKED DECIMAL STRING = 12345
14116          050222                  .EVEN
14117
```

```
14118                                   .SBTTL  ASHP
14119                                   ;*****************************************************************
14120                                   ;
14121                                   ;  ASHP TEST
14122                                   ;
14123                                   ;*****************************************************************
14124
14125  050222                           INLINE  <XASHP:>
14126  050222                                                                          XASHP:
14127  050222                           INLINE  <SCOPE>
14128  050222  000004                                                                  SCOPE
14129  050224                           LET $TIMES := #20              ;ITERATION COUNT
14130  050224  012737  000020  000404                                                 MOV     #20,$TIMES
14131  050232                           LET COUNT := TASH              ;GET TEST COUNT
14132  050232  013737  063044  000466                                                 MOV     TASH,COUNT
14133  050240                           LET TSTCAS := #TASH+2          ;POINT TO FIRST TEST CASE
14134  050240  012737  063046  000542                                                 MOV     #TASH+2,TSTCAS
14135  050246                           LET SIGNO := #0                ;INITIALIZE THE SIGN WORD
14136  050246  005037  000446                                                        CLR     SIGNO
14137                                   ;REPEAT
14138  050252                           INLINE  <$5076:>
14139  050252                                                                          $5076:
14140  050252                             CALL CLRDSB                  ;CLEAR DECIMAL STRING BUFFERS
14141  050252  004737  055520                                                        JSR     PC,CLRDSB
14142  050256                             LET CC.EXP := #0
14143  050256  005037  000520                                                        CLR     CC.EXP
14144
14145                                     ;+
14146                                     ; GET TEST DATA FROM TABLE
14147                                     ;-
14148
14149  050262                             LET R0 := TSTCAS
14150  050262  013700  000542                                                        MOV     TSTCAS,R0
14151  050266                             LET DATA00 := (R0)+          ;SRC LENGTH
14152  050266  012037  000560                                                        MOV     (R0)+,DATA00
14153  050272                             LET DATA01 := (R0)+          ;DST LENGTH
14154  050272  012037  000562                                                        MOV     (R0)+,DATA01
14155  050276                             LET DATA02 := (R0)           ;SHIFT DSCR.
14156  050276  011037  000564                                                        MOV     (R0),DATA02
14157
14158                                     ;+
14159                                     ;+
14160                                     ; PUT THE TEST STRING INTO DSBUF1 IN SIGNED PACKED FORMAT.  INCLUDE
14161                                     ; THE SIGN.
14162                                     ;-
14163
14164  050302                             LET R0 := #DSBUF1
14165  050302  012700  062370                                                        MOV     #DSBUF1,R0
14166  050306                             LET R1 := DATA00
14167  050306  013701  000560                                                        MOV     DATA00,R1
14168  050312                             IF R1 EQ #0 THEN                ;SRC.LEN = 0
14169  050312  005701                                                                TST     R1
14170  050314  001011                                                                BNE     $52144
14171  050316                               IF SIGNO EQ #0 THEN           ;SIGN IS +
14172  050316  005737  000446                                                        TST     SIGNO
14173  050322  001003                                                                BNE     $52145
```

```
14174  050324
14175  050324  112710  000014                    LET (R0) :B= #14
14176  050330
14177  050330  000402                          ELSE
14178  050332
14179  050332                                    LET (R0) :B= #15
14180  050332  112710  000015                  ENDIF
14181  050336
14182  050336
14183  050336                                  ELSE
14184  050336  000426
14185  050340
14186  050340                                    IF #BIT00 NOTSETIN R1 THEN
14187  050340  032701  000001
14188  050344  001003
14189  050346                                      LET (R0)+ :B= #4
14190  050346  112720  000004
14191  050352                                      LET R1 := R1 - #1
14192  050352  005301                           ENDIF
14193  050354
14194  050354                                    WHILE R1 NE #1 DO
14195  050354
14196  050354
14197  050354  020127  000001
14198  050360  001405
14199  050362                                      LET (R0)+ :B= #104
14200  050362  112720  000104
14201  050366                                      LET R1 := R1 - #2
14202  050366  162701  000002                   ENDDO
14203  050372
14204  050372  000770
14205  050374                                    IF SIGN0 EQ #0 THEN
14206  050374
14207  050374  005737  000446
14208  050400  001003
14209  050402                                      LET (R0) :B= #114
14210  050402  112710  000114
14211  050406                                    ELSE
14212  050406  000402
14213  050410
14214  050410                                      LET (R0) :B= #115
14215  050410  112710  000115                   ENDIF
14216  050414
14217  050414                                  ENDIF
14218  050414
14219  050414
14220
14221                                           ;+
14222                                           ; LOAD DS.EXP AND CC.EXP WITH EXPECTED RESULTS.
14223                                           ;-
14224
14225                                           ;GET SHIFT COUNT MAGNITUDE AND PUT IT INTO TEMP0.
14226
14227  050414                                   LET TEMP0 := DATA02
14228  050414  013737  000564  000474
14229  050422                                   IF #BIT07 SETIN TEMP0 THEN


                                                        MOVB    #14,(R0)
                                                  ;SIGN IS -
                                                        BR      $52146
                                                $52145:
                                                        MOVB    #15,(R0)
                                                $52146:
                                                        BR      $52147
                                                $52144:
                                                ;SRC.LEN IS EVEN AND > 0
                                                        BIT     #BIT00,R1
                                                        BNE     $52150
                                                        MOVB    #4,(R0)+
                                                ;DECREMENT COUNT
                                                        DEC     R1
                                                $52150:
                                                $52151:
                                                        CMP     R1,#1
                                                        BEQ     $52152
                                                ;MOVE TWO NIBBLES OF BCD
                                                        MOVB    #104,(R0)+
                                                ;DECREMENT COUNT
                                                        SUB     #2,R1
                                                        BR      $52151
                                                $52152:
                                                ;SIGN IS +
                                                        TST     SIGN0
                                                        BNE     $52153
                                                        MOVB    #114,(R0)
                                                ;SIGN IS -
                                                        BR      $52154
                                                $52153:
                                                        MOVB    #115,(R0)
                                                $52154:
                                                $52147:


                                                        MOV     DATA02,TEMP0
                                                ;NEGATIVE SHIFT COUNT
```

```
14230  050422  032737  000200  000474                                          BIT     #BIT07,TEMP0
14231  050430  001402                                                          BEQ     $52155
14232  050432                        LET TEMP0 := NEGATE TEMP0
14233  050432  005437  000474                                                  NEG     TEMP0
14234  050436                        ENDIF
14235  050436                                                          $52155:
14236  050436                        LET TEMP0 := TEMP0 CLR.BY #177600
14237  050436  042737  177600  000474                                          BIC     #177600,TEMP0
14238
14239                                ;TAKE CARE OF EXPECTED NBIT
14240
14241  050444                        IF SIGN0 EQ #-1 AND DATA00 NE #0 THEN
14242  050444  023727  000446  177777                                          CMP     SIGN0,#-1
14243  050452  001006                                                          BNE     $52156
14244  050454  005737  000560                                                  TST     DATA00
14245  050460  001403                                                          BEQ     $52156
14246  050462                          LET CC.EXP := CC.EXP SET.BY #NBIT
14247  050462  052737  000010  000520                                          BIS     #NBIT,CC.EXP
14248  050470                        ENDIF
14249  050470                                                          $52156:
14250
14251                                ;PUT THE SIGN NIBBLE INTO THE EXPECTED DESTINATION
14252
14253  050470                        LET R1 := DATA01                        ;DST.LEN
14254  050470  013701  000562                                                  MOV     DATA01,R1
14255  050474                        INLINE   <ASR  R1>
14256  050474  006201                                                          ASR  R1
14257  050476                        LET R1 := R1 + #DS.EXP
14258  050476  062701  062536                                                  ADD     #DS.EXP,R1
14259  050502                        IF SIGN0 EQ #0 OR DATA00 EQ #0 THEN
14260  050502  005737  000446                                                  TST     SIGN0
14261  050506  001403                                                          BEQ     $52157
14262  050510  005737  000560                                                  TST     DATA00
14263  050514  001003                                                          BNE     $52160
14264  050516                                                          $52157:
14265  050516                          LET (R1) :B= (R1) SET.BY #14          ;POSITIVE SIGN
14266  050516  152711  000014                                                  BISB    #14,(R1)
14267  050522                        ELSE
14268  050522  000402                                                          BR      $52161
14269  050524                                                          $52160:
14270  050524                          LET (R1) :B= (R1) SET.BY #15          ;NEGATIVE SIGN
14271  050524  152711  000015                                                  BISB    #15,(R1)
14272  050530                        ENDIF
14273  050530                                                          $52161:
14274
14275                                ;TAKE CARE OF ZERO LENGTH SOURCE OR DESTINATION
14276
14277  050530                        IF DATA00 EQ #0 OR DATA01 EQ #0 THEN
14278  050530  005737  000560                                                  TST     DATA00
14279  050534  001403                                                          BEQ     $52162
14280  050536  005737  000562                                                  TST     DATA01
14281  050542  001003                                                          BNE     $52163
14282  050544                                                          $52162:
14283  050544                          LET CC.EXP := CC.EXP SET.BY #ZBIT
14284  050544  052737  000004  000520                                          BIS     #ZBIT,CC.EXP
14285  050552                        ENDIF
```

```
14286  050552                                                                          $52163:
14287  050552                          IF DATA00 NE #0 AND DATA01 NE #0 AND #BIT07 SETIN DATA02 THEN
14288  050552  005737  000560                                                                  TST     DATA00
14289  050556  001531                                                                          BEQ     $52164
14290  050560  005737  000562                                                                  TST     DATA01
14291  050564  001526                                                                          BEQ     $52164
14292  050566  032737  000200  000564                                                         BIT     #BIT07,DATA02
14293  050574  001522                                                                          BEQ     $52164
14294
14295                                    ;TAKE CARE OF NEGATIVE SHIFT
14296
14297  050576                            LET R0 := DATA00 - TEMP0              ;SRC.LEN - SHIFT COUNT
14298  050576  013700  000560                                                                  MOV     DATA00,R0
14299  050602  163700  000474                                                                  SUB     TEMP0,R0
14300  050606                            LET R1 := DATA01                      ;DST.LEN
14301  050606  013701  000562                                                                  MOV     DATA01,R1
14302  050612                            INLINE   <ASR  R1>
14303  050612  006201                                                                          ASR  R1
14304  050614                            LET R1 := R1 + #DS.EXP
14305  050614  062701  062536                                                                  ADD     #DS.EXP,R1
14306  050620                            LET R2 := #1
14307  050620  012702  000001                                                                  MOV     #1,R2
14308  050624                            LET R3 := DATA01
14309  050624  013703  000562                                                                  MOV     DATA01,R3
14310  050630                            IF R0 EQ #0 THEN
14311  050630  005700                                                                          TST     R0
14312  050632  001024                                                                          BNE     $52165
14313  050634                              IF DATA02 HIS #3000 THEN
14314  050634  023727  000564  003000                                                         CMP     DATA02,#3000
14315  050642  103403                                                                          BLO     $52166
14316  050644                                LET (R1) :B= (R1) SET.BY #20        ;ROUNDING
14317  050644  152711  000020                                                                  BISB    #20,(R1)
14318  050650                              ELSE
14319  050650  000415                                                                          BR      $52167
14320  050652                                                                        $52166:
14321  050652                                LET CC.EXP := CC.EXP SET.BY #ZBIT
14322  050652  052737  000004  000520                                                         BIS     #ZBIT,CC.EXP
14323  050660                                LET CC.EXP := CC.EXP CLR.BY #NBIT
14324  050660  042737  000010  000520                                                         BIC     #NBIT,CC.EXP
14325  050666                                LET R5 := DATA01
14326  050666  013705  000562                                                                 MOV     DATA01,R5
14327  050672                                INLINE   <ASR  R5>
14328  050672  006205                                                                         ASR  R5
14329  050674                                LET R5 := R5 + #DS.EXP
14330  050674  062705  062536                                                                 ADD     #DS.EXP,R5
14331  050700                                LET (R5) :B= (R5) CLR.BY #1
14332  050700  142715  000001                                                                 BICB    #1,(R5)
14333  050704                              ENDIF
14334  050704                                                                        $52167:
14335  050704                            ENDIF
14336  050704                            IF R0 LT #0 THEN                            $52165:
14337  050704
14338  050704  005700                                                                         TST     R0
14339  050706  002015                                                                         BGE     $52170
14340  050710                              LET CC.EXP := CC.EXP SET.BY #ZBIT
14341  050710  052737  000004  000520                                                         BIS     #ZBIT,CC.EXP
```

```
14342  050716
14343  050716  042737  000010  000520          LET CC.EXP := CC.EXP CLR.BY #NBIT                       BIC     #NBIT,CC.EXP
14344  050724
14345  050724  013705  000562                  LET R5 := DATA01                                        MOV     DATA01,R5
14346  050730
14347  050730  006205                          INLINE   <ASR  R5>                                      ASR  R5
14348  050732
14349  050732  062705  062536                  LET R5 := R5 + #DS.EXP                                  ADD     #DS.EXP,R5
14350  050736
14351  050736  142715  000001                  LET (R5) :B= (R5) CLR.BY #1                             BICB    #1,(R5)
14352  050742                                  ENDIF
14353  050742                                                                                  $52170:
14354  050742                                  WHILE R2 LE R0 AND R3 HI #0 DO                  $52171:
14355  050742
14356  050742  020200                                                                                  CMP     R2,R0
14357  050744  003027                                                                                  BGT     $52172
14358  050746  005703                                                                                  TST     R3
14359  050750  101425                                                                                  BLOS    $52172
14360  050752
14361  050752  032702  000001                  IF #BIT00 SETIN R2 THEN                                 BIT     #BIT00,R2
14362  050756  001415                                                                                  BEQ     $52173
14363  050760
14364  050760  152711  000100                    LET (R1) :B= (R1) SET.BY #100                         BISB    #100,(R1)
14365  050764
14366  050764  020227  000001                    IF R2 EQ #1 AND DATA02 HIS #3000 THEN                 CMP     R2,#1
14367  050770  001006                                                                                  BNE     $52174
14368  050772  023727  000564  003000                                                                  CMP     DATA02,#3000
14369  051000  103402                                                                                  BLO     $52174
14370  051002
14371  051002  152711  000020                      LET (R1) :B= (R1) SET.BY #20        ;ROUNDING     BISB    #20,(R1)
14372  051006                                    ENDIF
14373  051006                                                                                  $52174:
14374  051006                                    LET R1 := R1 - #1                                     DEC     R1
14375  051006  005301
14376  051010                                  ELSE                                                    BR      $52175
14377  051010  000402                                                                          $52173:
14378  051012
14379  051012                                    LET (R1) :B= (R1) SET.BY #4                           BISB    #4,(R1)
14380  051012  152711  000004
14381  051016                                  ENDIF                                           $52175:
14382  051016
14383  051016                                  LET R2 := R2 + #1                                       INC     R2
14384  051016  005202
14385  051020                                  LET R3 := R3 - #1                                       DEC     R3
14386  051020  005303
14387  051022                                ENDDO                                                     BR      $52171
14388  051022  000747                                                                          $52172:
14389  051024
14390  051024                                IF R3 EQ #0 AND R2 LE R0 THEN                             TST     R3
14391  051024  005703                                                                                  BNE     $52176
14392  051026  001005                                                                                  CMP     R2,R0
14393  051030  020200                                                                                  BGT     $52176
14394  051032  003003
14395  051034
14396  051034  052737  000002  000520            LET CC.EXP := CC.EXP SET.BY #VBIT                     BIS     #VBIT,CC.EXP
14397  051042                                  ENDIF
```

```
14398  051042                                                                                $52176:
14399  051042                          ENDIF
14400  051042                                                                                $52164:
14401  051042                          IF DATA00 NE #0 AND DATA01 NE #0 AND #BIT07 NOTSETIN DATA02 THEN
14402  051042  005737  000560                                                                TST     DATA00
14403  051046  001506                                                                        BEQ     $52177
14404  051050  005737  000562                                                                TST     DATA01
14405  051054  001503                                                                        BEQ     $52177
14406  051056  032737  000200  000564                                                       BIT     #BIT07,DATA02
14407  051064  001077                                                                        BNE     $52177
14408
14409
14410                              ;TAKE CARE OF POSITIVE SHIFT
14411
14412  051066                      IF #BIT07 NOTSETIN DATA02 THEN
14413  051066  032737  000200  000564                                                       BIT     #BIT07,DATA02
14414  051074  001073                                                                        BNE     $52200
14415  051076                        LET TEMP1 := DATA00 + TEMP0                ;SRC.LEN + SHIFT COUNT
14416  051076  013737  000560  000476                                                       MOV     DATA00,TEMP1
14417  051104  063737  000474  000476                                                       ADD     TEMP0,TEMP1
14418  051112                        IF TEMP1 HI DATA01 THEN
14419  051112  023737  000476  000562                                                       CMP     TEMP1,DATA01
14420  051120  101403                                                                        BLOS    $52201
14421  051122                          LET CC.EXP := CC.EXP SET.BY #VBIT
14422  051122  052737  000002  000520                                                       BIS     #VBIT,CC.EXP
14423  051130                        ENDIF
14424  051130                                                                              $52201:
14425  051130                        IF TEMP0 HIS DATA01 THEN
14426  051130  023737  000474  000562                                                       CMP     TEMP0,DATA01
14427  051136  103407                                                                        BLO     $52202
14428  051140                          LET CC.EXP := CC.EXP SET.BY #ZBIT
14429  051140  052737  000004  000520                                                       BIS     #ZBIT,CC.EXP
14430  051146                          LET CC.EXP := CC.EXP CLR.BY #NBIT
14431  051146  042737  000010  000520                                                       BIC     #NBIT,CC.EXP
14432  051154                        ELSE
14433  051154  000443                                                                        BR      $52203
14434  051156                                                                            $52202:
14435  051156                          LET R4 := TEMP0 + #1                     ;SHIFT COUNT + 1
14436  051156  013704  000474                                                             MOV     TEMP0,R4
14437  051162  005204                                                                     INC     R4
14438  051164                          INLINE   <ASR  R4>
14439  051164  006204                                                                     ASR  R4
14440  051166                          LET R1 := DATA01                         ;DST.LEN
14441  051166  013701  000562                                                             MOV     DATA01,R1
14442  051172                          INLINE   <ASR  R1>
14443  051172  006201                                                                     ASR  R1
14444  051174                          LET R1 := R1 + #DS.EXP - R4
14445  051174  062701  062536                                                             ADD     #DS.EXP,R1
14446  051200  160401                                                                     SUB     R4,R1
14447  051202                          LET R0 := TEMP0                          ;SHIFT COUNT
14448  051202  013700  000474                                                             MOV     TEMP0,R0
14449  051206                          LET R2 := DATA00                         ;SRC.LEN
14450  051206  013702  000560                                                             MOV     DATA00,R2
14451  051212                          LET R3 := DATA01 - TEMP0                 ;DST.LEN - SHIFT COUNT
14452  051212  013703  000562                                                             MOV     DATA01,R3
14453  051216  163703  000474                                                             SUB     TEMP0,R3
```

```
14454  051222                          WHILE R2 NE #0 AND R3 NE #0 DO
14455  051222                                                                  $52204:
14456  051222  005702                                                                  TST     R2
14457  051224  001417                                                                  BEQ     $52205
14458  051226  005703                                                                  TST     R3
14459  051230  001415                                                                  BEQ     $52205
14460  051232
14461  051232  032700  000001            IF #BIT00 NOTSETIN R0 THEN                    BIT     #BIT00,R0
14462  051236  001004                                                                  BNE     $52206
14463  051240
14464  051240  152711  000100              LET (R1) :B= (R1) SET.BY #100               BISB    #100,(R1)
14465  051244
14466  051244  005301                      LET R1 := R1 - #1                           DEC     R1
14467  051246
14468  051246  000402                    ELSE                                          BR      $52207
14469  051250                                                                  $52206:
14470  051250
14471  051250  152711  000004              LET (R1) :B= (R1) SET.BY #4                 BISB    #4,(R1)
14472  051254
14473  051254                            ENDIF                                 $52207:
14474  051254
14475  051254  005100                    LET R0 := COMP R0                   ;TOGGLE SHIFT COUNT
14476  051256                                                                          COM     R0
14477  051256  005302                    LET R2 := R2 - #1                             DEC     R2
14478  051260
14479  051260  005303                    LET R3 := R3 - #1                             DEC     R3
14480  051262
14481  051262  000757                  ENDDO                                         BR      $52204
14482  051264                                                                  $52205:
14483  051264                          ENDIF
14484  051264                                                                  $52203:
14485  051264                            ENDIF
14486  051264                                                                  $52200:
14487  051264                        ENDIF
14488  051264                                                                  $52177:
14489
14490                                  ;+
14491                                  ; DO THE ASHP INSTRUCTION USING SIGNED PACKED (UNSIGNED
14492                                  ; PACKED WILL BE TESTED IN THE INLINE PORTION OF THE TEST).
14493                                  ; CHECK THE RESULTS AND REPORT ANY ERRORS.
14494                                  ;-
14495
14496  051264
14497  051264  013700  000560         LET R0 := DATA00 SET.BY #60000                      MOV     DATA00,R0
14498  051270  052700  060000                                                             BIS     #60000,R0
14499  051274
14500  051274  012701  062370         LET R1 := #DSBUF1                                   MOV     #DSBUF1,R1
14501  051300
14502  051300  013702  000562         LET R2 := DATA01 SET.BY #60000                      MOV     DATA01,R2
14503  051304  052702  060000                                                             BIS     #60000,R2
14504  051310
14505  051310  012703  062474         LET R3 := #DS.DST                                   MOV     #DS.DST,R3
14506  051314
14507  051314  013704  000564         LET R4 := DATA02                                    MOV     DATA02,R4
14508  051320
14509  051320  005005                  LET R5 := #0                                        CLR     R5
```

```
14510  051322                          INLINE   <ASHP>
14511  051322  076076                                                  ASHP
14512                                  ;CHECK RESULTS
14513  051324                          LET CC := PSW
14514  051324  013737  177776  000516                                  MOV     PSW,CC
14515  051332                          LET CC := CC CLR.BY #177760
14516  051332  042737  177760  000516                                  BIC     #177760,CC
14517  051340                          IF CC NE CC.EXP THEN
14518  051340  023737  000516  000520                                  CMP     CC,CC.EXP
14519  051346  001402                                                  BEQ     $52210
14520  051350                            CALL ERROR
14521  051350  004737  056274                                          JSR     PC,ERROR
14522  051354                          ENDIF
14523  051354                                                        $52210:
14524  051354                          IF R0 NE #0 OR R1 NE #0 THEN
14525  051354  005700                                                  TST     R0
14526  051356  001002                                                  BNE     $52211
14527  051360  005701                                                  TST     R1
14528  051362  001402                                                  BEQ     $52212
14529  051364                                                        $52211:
14530  051364                            CALL ERROR
14531  051364  004737  056274                                          JSR     PC,ERROR
14532  051370                          ENDIF
14533  051370                                                        $52212:
14534  051370                          IF R4 NE #0 OR R5 NE #0 THEN
14535  051370  005704                                                  TST     R4
14536  051372  001002                                                  BNE     $52213
14537  051374  005705                                                  TST     R5
14538  051376  001402                                                  BEQ     $52214
14539  051400                                                        $52213:
14540  051400                            CALL ERROR
14541  051400  004737  056274                                          JSR     PC,ERROR
14542  051404                          ENDIF
14543  051404                                                        $52214:
14544  051404                          LET TEMP0 := DATA01 SET.BY #60000
14545  051404  013737  000562  000474                                  MOV     DATA01,TEMP0
14546  051412  052737  060000  000474                                  BIS     #60000,TEMP0
14547  051420                          IF R2 NE TEMP0 THEN
14548  051420  020237  000474                                          CMP     R2,TEMP0
14549  051424  001402                                                  BEQ     $52215
14550  051426                            CALL ERROR
14551  051426  004737  056274                                          JSR     PC,ERROR
14552  051432                          ENDIF
14553  051432                                                        $52215:
14554  051432                          IF R3 NE #DS.DST THEN
14555  051432  020327  062474                                          CMP     R3,#DS.DST
14556  051436  001402                                                  BEQ     $52216
14557  051440                            CALL ERROR
14558  051440  004737  056274                                          JSR     PC,ERROR
14559  051444                          ENDIF
14560  051444                                                        $52216:
14561                                  ;SEE IF DS.DST = DS.EXP
14562
14563  051444                          LET R0 := #40
14564  051444  012700  000040                                          MOV     #40,R0
14565  051450                          LET R1 := #DS.EXP
```

```
14566  051450  012701  062536                    LET R2 := #DS.DST                                   MOV     #DS.EXP,R1
14567  051454                                                                                        MOV     #DS.DST,R2
14568  051454  012702  062474                    LET ERRFLG := #0
14569  051460                                                                                        CLR     ERRFLG
14570  051460  005037  000454                    WHILE R0 HI #0 AND ERRFLG EQ #0 DO
14571  051464                                                                                $52217:
14572  051464                                                                                        TST     R0
14573  051464  005700                                                                                BLOS    $52220
14574  051466  101412                                                                                TST     ERRFLG
14575  051470  005737  000454                                                                       BNE     $52220
14576  051474  001007
14577  051476                                      IFB (R1)+ NE (R2)+ THEN                           CMPB    (R1)+,(R2)+
14578  051476  122122                                                                                BEQ     $52221
14579  051500  001403
14580  051502                                        LET ERRFLG := #-1
14581  051502  012737  177777  000454                                                               MOV     #-1,ERRFLG
14582  051510                                      ENDIF
14583  051510                                                                                $52221:
14584  051510
14585  051510  005300                              LET R0 := R0 - #1                                 DEC     R0
14586  051512                                    ENDDO
14587  051512  000764                                                                               BR      $52217
14588  051514                                                                                $52220:
14589  051514                                    IF ERRFLG NE #0 THEN
14590  051514  005737  000454                                                                       TST     ERRFLG
14591  051520  001402                                                                               BEQ     $52222
14592  051522                                      CALL ERROR                    ;DS.DST AND DS.EXP DO NOT MATCH
14593  051522  004737  056274                                                                       JSR     PC,ERROR
14594  051526                                    ENDIF
14595  051526                                                                                $52222:
14596  051526                                    LET SIGNO := COMP SIGNO         ;REPEAT THE TEST CASE WITH A NEGATIVE
14597  051526  005137  000446                                                                       COM     SIGNO
14598                                                                            ;  SIGN BEFORE MOVING ON TO THE NEXT TEST CASE
14599  051532                                    IF SIGNO EQ #0 THEN
14600  051532  005737  000446                                                                       TST     SIGNO
14601  051536  001005                                                                               BNE     $52223
14602  051540                                      LET TSTCAS := TSTCAS + #6
14603  051540  062737  000006  000542                                                               ADD     #6,TSTCAS
14604  051546                                      LET COUNT := COUNT - #1
14605  051546  005337  000466                                                                       DEC     COUNT
14606  051552                                    ENDIF
14607  051552                                                                                $52223:
14608                                          ;UNTIL COUNT EQ #0
14609  051552                                  IF COUNT NE #0 THEN
14610  051552  005737  000466                                                                       TST     COUNT
14611  051556  001402                                                                               BEQ     $52224
14612  051560                                      INLINE   <JMP   $5076>
14613  051560  000137  050252                                                                       JMP     $5076
14614  051564                                  ENDIF
14615  051564                                                                                $52224:
14616
14617
14618
14619                                          ;+
14620                                          ; DO ONE INLINE CASE - ASHPI.  USE UNSIGNED PACKED.
14621                                          ;-
```

```
14622
14623  051564
14624  051564  004737  055520          CALL   CLRDSB                                                    JSR     PC,CLRDSB
14625  051570
14626  051570  112737  000231  062370  LET DSBUF1 :B= #231              ;9/9                             MOVB    #231,DSBUF1
14627  051576
14628  051576  112737  000231  062371  LET DSBUF1+1 :B= #231            ;9/9                             MOVB    #231,DSBUF1+1
14629  051604
14630  051604  112737  000237  062372  LET DSBUF1+2 :B= #237            ;9/17                            MOVB    #237,DSBUF1+2
14631  051612
14632  051612  004737  055330          CALL CLRREG                                                      JSR     PC,CLRREG
14633  051616
14634  051616  076176                  INLINE   <ASHPI>                                                 ASHPI
14635  051620
14636  051620  052010                  INLINE   <.WORD   TASHPI>                                        .WORD   TASHPI
14637  051622
14638  051622  052014                  INLINE   <.WORD   TASHPI+4>                                      .WORD   TASHPI+4
14639  051624
14640  051624  000375                  INLINE   <.WORD   375>           ;SHIFT COUNT = -3, RND DIGIT = 0 .WORD   375
14641  051626
14642  051626  013737  177776  000516  LET CC := PSW                                                    MOV     PSW,CC
14643  051634
14644  051634  042737  177760  000516  LET CC := CC CLR.BY #177760                                     BIC     #177760,CC
14645  051642
14646  051642  005737  000516          IF CC NE #0 THEN                 ;VBIT SHOULD BE SET             TST     CC
14647  051646  001402                                                                                   BEQ     $52225
14648  051650
14649  051650  004737  056274            CALL ERROR                                                     JSR     PC,ERROR
14650  051654                          ENDIF
14651  051654                                                                                 $52225:
14652  051654                          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
14653  051654  005700                                                                                   TST     R0
14654  051656  001004                                                                                   BNE     $52226
14655  051660  005701                                                                                   TST     R1
14656  051662  001002                                                                                   BNE     $52226
14657  051664  005702                                                                                   TST     R2
14658  051666  001402                                                                                   BEQ     $52227
14659  051670                                                                                 $52226:
14660  051670                            CALL ERROR
14661  051670  004737  056274                                                                           JSR     PC,ERROR
14662  051674                          ENDIF
14663  051674                                                                                 $52227:
14664  051674                          IF R3 NE #0 OR R4 NE #0 OR R5 NE #0 THEN
14665  051674  005703                                                                                   TST     R3
14666  051676  001004                                                                                   BNE     $52230
14667  051700  005704                                                                                   TST     R4
14668  051702  001002                                                                                   BNE     $52230
14669  051704  005705                                                                                   TST     R5
14670  051706  001402                                                                                   BEQ     $52231
14671  051710                                                                                 $52230:
14672  051710                            CALL ERROR
14673  051710  004737  056274                                                                           JSR     PC,ERROR
14674  051714                          ENDIF
14675  051714                                                                                 $52231:
14676
14677  051714                          ;CHECK DS.DST
                                       LET R0 := #DS.DST
```

```
14678  051714  012700  062474                                                                  MOV     #DS.DST,R0
14679  051720                          IFB (R0)+ NE #11 THEN                    ;FIRST BYTE = 0/9
14680  051720  122027  000011                                                                  CMPB    (R0)+,#11
14681  051724  001402                                                                         BEQ     $52232
14682  051726                            CALL ERROR
14683  051726  004737  056274                                                                  JSR     PC,ERROR
14684  051732                          ENDIF
14685  051732                                                                          $52232:
14686  051732                          IFB (R0)+ NE #237 THEN                   ;SECOND BYTE = 9/17
14687  051732  122027  000237                                                                  CMPB    (R0)+,#237
14688  051736  001402                                                                         BEQ     $52233
14689  051740                            CALL ERROR
14690  051740  004737  056274                                                                  JSR     PC,ERROR
14691  051744                          ENDIF
14692  051744                                                                          $52233:
14693  051744                          LET ERRFLG :- #0
14694  051744  005037  000454                                                                  CLR     ERRFLG
14695  051750                          WHILE ERRFLG NE #0 AND R0 NE #DS.DST+37 DO
14696  051750                                                                          $52234:
14697  051750  005737  000454                                                                  TST     ERRFLG
14698  051754  001413                                                                         BEQ     $52235
14699  051756  020027  062533                                                                  CMP     R0,#DS.DST+37
14700  051762  001410                                                                         BEQ     $52235
14701  051764                            IFB (R0)+ NE #0 THEN
14702  051764  105720                                                                         TSTB    (R0)+
14703  051766  001405                                                                         BEQ     $52236
14704  051770                              LET ERRFLG := #-1
14705  051770  012737  177777  000454                                                         MOV     #-1,ERRFLG
14706  051776                              CALL ERROR
14707  051776  004737  056274                                                                  JSR     PC,ERROR
14708  052002                            ENDIF
14709  052002                                                                          $52236:
14710  052002                          ENDDO
14711  052002  000762                                                                         BR      $52234
14712  052004                                                                          $52235:
14713  052004                          INLINE    <JMP     CIS7END>
14714  052004  000137  052020                                                                  JMP     CIS7END
14715
14716
14717
14718
14719                                  ;+
14720                                  ; INLINE TEST CASE
14721                                  ;-
14722
14723  052010  070005                  TASHPI: .WORD   070005          ;SRC.DSCR, UNSIGNED PACKED, SRC.LEN = 5
14724  052012  062370                          .WORD   DSBUF1          ;SRC.DSCR
14725  052014  070002                          .WORD   070002          ;DST.DSCR, UNSIGNED PACKED, DST.LEN = 2
14726  052016  062474                          .WORD   DS.DST          ;DST.DSCR
14727
14728  052020                          INLINE    <CIS7END:>
14729  052020                                                                          CIS7END:
14730
14731
```

```
                                ;*****************************************************************
                                ;*****************************************************************
                                ;++
                                ;                C I S 8      M O D U L E
                                ;
                                ;  THIS MODULE TESTS THE PACKED MULTIPLY INSTRUCTION: MULP.
                                ;--
                                ;*****************************************************************
                                ;*****************************************************************




                                .SBTTL  CIS8 INITIALIZATION
                                ;*****************************************************************
                                ;
                                ;  CIS8 INITIALIZATION
                                ;
                                ;*****************************************************************

                                ;IF SWR<5:0> ARE CLEARED OR IF SWR<4> IS SET THEN EXECUTE
                                ;  THE CIS8 MODULE; OTHERWISE, SKIP TO THE NEXT CIS MODULE.

052020                          INLINE   <SCOPE>
052020  000004                                                         SCOPE

052022                          LET TEMP0 := @SWR CLR.BY #177700
052022  017737  126400  000474                                        MOV     @SWR,TEMP0
052030  042737  177700  000474                                        BIC     #177700,TEMP0
052036                          IF TEMP0 NE #0 THEN
052036  005737  000474                                                TST     TEMP0
052042  001406                                                        BEQ     $52237
052044                            IF #BIT4 NOTSETIN TEMP0 THEN
052044  032737  000020  000474                                        BIT     #BIT4,TEMP0
052052  001002                                                        BNE     $52240
052054                              INLINE   <JMP   CIS8END>
052054  000137  053140                                                JMP     CIS8END
052060                            ENDIF                         $52240:
052060                          ENDIF                           $52237:
052060
052060                          LET CTL := #8.          ;CONTROL CHIP NUMBER
052060  012737  000010  000544                                        MOV     #8.,CTL
052066                          LET ERRFLG := #0        ;INITIALIZE ERROR FLAG
052066  005037  000454                                                CLR     ERRFLG
052072                          LET PSW := #340
052072  012737  000340  177776                                        MOV     #340,PSW
052100                          LET ERR := #1
052100  012737  000001  000550                                        MOV     #1,ERR
```

```
14782
14783                                   .SBTTL  MULP
14784                                   ;*****************************
14785                                   ;+
14786                                   ;       MULP TEST
14787                                   ;-
14788                                   ;*****************************
14789
14790  052106                           INLINE <XMULP:>
14791  052106                                                                                  XMULF:
14792  052106                           INLINE <SCOPE>                                         SCOPE
14793  052106  000004
14794  052110                           LET $TIMES := #20              ;ITERATION COUNT        MOV     #20,$TIMES
14795  052110  012737  000020  000404
14796  052116                           LET COUNT := TAB89             ;# OF TEST CASES        MOV     TAB89,COUNT
14797  052116  013737  054304  000466
14798  052124                           LET TSTCAS := #TAB89+2         ;POINT TO FIRST TEST CASE
14799  052124  012737  054306  000542                                                          MOV     #TAB89+2,TSTCAS
14800
14801                                   ;+
14802                                   ;       CLR R0.EXT TO R3.EXP
14803                                   ;-
14804
14805  052132                           INCR  R0 FROM #0 TO #6 BY #2
14806  052132  005000                                                                         CLR     R0
14807  052134  000402                                                                         BR      $52241
14808  052136                                                                          $52242:
14809  052136  062700  000002                                                                ADD     #2,R0
14810  052142                                                                          $52241:
14811  052142  020027  000006                                                                CMP     R0,#6
14812  052146  003003                                                                         BGT     $52243
14813  052150                            INLINE <CLR R0.EXP(R0)>
14814  052150  005060  000522                                                                CLR R0.EXP(R0)
14815  052154
14816  052154  000770                                                                         BR      $52242
14817  052156                                                                          $52243:
14818
14819  052156                           ;REPEAT OUTER LOOP FOR TEST CASES
14820  052156                           INLINE <$5074:>                                        $5074:
14821  052156
14822  052156  004737  055520           CALL CLRDSB                    ;CLR DS BUFFERS         JSR     PC,CLRDSB
14823
14824                                   ;+
14825                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
14826                                   ;-
14827
14828  052162                           LET R0 := TSTCAS
14829  052162  013700  000542                                                                MOV     TSTCAS,R0
14830  052166                           LET DATA00 := (R0)+            ;SRC1 LENGTH            MOV     (R0)+,DATA00
14831  052166  012037  000560
14832  052172                           LET DATA01 := (R0)+            ;POINTER TO SRC1 DATA   MOV     (R0)+,DATA01
14833  052172  012037  000562
14834  052176                           LET DATA02 := (R0)+            ;SRC2 LENGTH            MOV     (R0)+,DATA02
14835  052176  012037  000564
14836  052202                           LET DATA03 := (R0)+            ;POINTER TO SRC2 DATA   MOV     (R0)+,DATA03
14837  052202  012037  000566
```

```
14838  052206                          LET DATA04 := (R0)+             ;DEST LENGTH
14839  052206  012037  000570                                                  MOV     (R0)+,DATA04
14840  052212                          LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (PRODUCT)
14841  052212  012037  000572                                                  MOV     (R0)+,DATA05
14842  052216                          LET CC.EXP := (R0)+             ;CC.EXP (PRODUCT)
14843  052216  012037  000520                                                  MOV     (R0)+,CC.EXP
14844
14845                                  ;+
14846                                  ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
14847                                  ;-
14848
14849  052222                          LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
14850  052222  012705  061766                                                  MOV     #CHRSET,R5
14851  052226                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
14852  052226  010546                                                          MOV     R5,-(SP)
14853  052230  013745  000560                                                  MOV     DATA00,-(R5)
14854  052234  013745  000562                                                  MOV     DATA01,-(R5)
14855  052240  012745  062370                                                  MOV     #DSBUF1,-(R5)
14856  052244  004737  055646                                                  JSR     PC,PACK
14857  052250  012605                                                          MOV     (SP)+,R5
14858  052252                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
14859  052252  010546                                                          MOV     R5,-(SP)
14860  052254  013745  000564                                                  MOV     DATA02,-(R5)
14861  052260  013745  000566                                                  MOV     DATA03,-(R5)
14862  052264  012745  062432                                                  MOV     #DSBUF2,-(R5)
14863  052270  004737  055646                                                  JSR     PC,PACK
14864  052274  012605                                                          MOV     (SP)+,R5
14865  052276                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
14866  052276  010546                                                          MOV     R5,-(SP)
14867  052300  013745  000570                                                  MOV     DATA04,-(R5)
14868  052304  013745  000572                                                  MOV     DATA05,-(R5)
14869  052310  012745  062536                                                  MOV     #DS.EXP,-(R5)
14870  052314  004737  055646                                                  JSR     PC,PACK
14871  052320  012605                                                          MOV     (SP)+,R5
14872
14873                                  ;+
14874                                  ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
14875                                  ;-
14876
14877  052322                          LET R0 := DATA00 SET.BY #60000
14878  052322  013700  000560                                                  MOV     DATA00,R0
14879  052326  052700  060000                                                  BIS     #60000,R0
14880  052332                          LET R1 := #DSBUF1
14881  052332  012701  062370                                                  MOV     #DSBUF1,R1
14882  052336                          LET R2 := DATA02 SET.BY #60000
14883  052336  013702  000564                                                  MOV     DATA02,R2
14884  052342  052702  060000                                                  BIS     #60000,R2
14885  052346                          LET R3 := #DSBUF2
14886  052346  012703  062432                                                  MOV     #DSBUF2,R3
14887  052352                          LET R4 := DATA04 SET.BY #60000
14888  052352  013704  000570                                                  MOV     DATA04,R4
14889  052356  052704  060000                                                  BIS     #60000,R4
14890  052362                          LET R5 := #DS.DST
14891  052362  012705  062474                                                  MOV     #DS.DST,R5
14892
14893                                  ;+
```

```
14894                                   ;       FINISH SET UP & DO CIS INSTRUCTION
14895                                   ;-
14896
14897
14898  052366                           LET R4.EXP := R4
14899  052366  010437  000532                                                  MOV     R4,R4.EXP
14900  052372                           LET R5.EXP := R5
14901  052372  010537  000534                                                  MOV     R5,R5.EXP
14902  052376                           INLINE <MULP>
14903  052376  076074                                                          MULP
14904
14905                                   ;+
14906                                   ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
14907                                   ;-
14908
14909  052400                           LET CC := PSW
14910  052400  013737  177776  000516                                          MOV     PSW,CC
14911  052406                           LET CC := CC CLR.BY #177760
14912  052406  042737  177760  000516                                          BIC     #177760,CC
14913  052414                           IF CC NE CC.EXP THEN
14914  052414  023737  000516  000520                                          CMP     CC,CC.EXP
14915  052422  001402                                                          BEQ     $52244
14916  052424                             CALL ERROR
14917  052424  004737  056274                                                  JSR     PC,ERROR
14918  052430                           ENDIF
14919  052430                                                          $52244:
14920  052430                           IF R0 NE R0.EXP THEN
14921  052430  020037  000522                                                  CMP     R0,R0.EXP
14922  052434  001402                                                          BEQ     $52245
14923  052436                             CALL ERROR
14924  052436  004737  056274                                                  JSR     PC,ERROR
14925  052442                           ENDIF
14926  052442                                                          $52245:
14927  052442                           IF R1 NE R1.EXP THEN
14928  052442  020137  000524                                                  CMP     R1,R1.EXP
14929  052446  001402                                                          BEQ     $52246
14930  052450                             CALL ERROR
14931  052450  004737  056274                                                  JSR     PC,ERROR
14932  052454                           ENDIF
14933  052454                                                          $52246:
14934  052454                           IF R2 NE R2.EXP THEN
14935  052454  020237  000526                                                  CMP     R2,R2.EXP
14936  052460  001402                                                          BEQ     $52247
14937  052462                             CALL ERROR
14938  052462  004737  056274                                                  JSR     PC,ERROR
14939  052466                           ENDIF
14940  052466                                                          $52247:
14941  052466                           IF R3 NE R3.EXP THEN
14942  052466  020337  000530                                                  CMP     R3,R3.EXP
14943  052472  001402                                                          BEQ     $52250
14944  052474                             CALL ERROR
14945  052474  004737  056274                                                  JSR     PC,ERROR
14946  052500                           ENDIF
14947  052500                                                          $52250:
14948  052500                           IF R4 NE R4.EXP THEN
14949  052500  020437  000532                                                  CMP     R4,R4.EXP
```

```
14950  052504  001402                          BEQ     $52251
14951  052506                                    CALL ERROR
14952  052506  004737  056274                  JSR     PC,ERROR
14953  052512                                  ENDIF
14954  052512                                $52251:
14955  052512                                  IF R5 NE R5.EXP THEN
14956  052512  020537  000534                  CMP     R5,R5.EXP
14957  052516  001402                          BEQ     $52252
14958  052520                                    CALL ERROR
14959  052520  004737  056274                  JSR     PC,ERROR
14960  052524                                  ENDIF
14961  052524                                $52252:
14962
14963
14964                                          ;+
14965                                          ;       CHECK RESULTS VS EXPECTED RESULTS
14966                                          ;-
14967
14968  052524                                  LET R0 := #DS.DST
14969  052524  012700  062474                  MOV     #DS.DST,R0
14970  052530                                  LET R1 := #DS.EXP
14971  052530  012701  062536                  MOV     #DS.EXP,R1
14972  052534                                  LET ERRFLG := #0
14973  052534  005037  000454                  CLR     ERRFLG
14974  052540                                  WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
14975  052540                                $52253:
14976  052540  020027  062534                  CMP     R0,#DS.DST+40
14977  052544  001410                          BEQ     $52254
14978  052546  005737  000454                  TST     ERRFLG
14979  052552  001005                          BNE     $52254
14980  052554                                    IFB (R0)+ NE (R1)+ THEN
14981  052554  122021                          CMPB    (R0)+,(R1)+
14982  052556  001402                          BEQ     $52255
14983  052560                                     CALL ERROR
14984  052560  004737  056274                  JSR     PC,ERROR
14985  052564                                    ENDIF
14986  052564                                $52255:
14987  052564                                  ENDDO
14988  052564  000765                          BR      $52253
14989  052566                                $52254:
14990  052566                                  LET TSTCAS := TSTCAS + #22
14991  052566  062737  000022  000542          ADD     #22,TSTCAS
14992  052574                                  LET COUNT := COUNT - #1
14993  052574  005337  000466                  DEC     COUNT
14994                                         ;UNTIL COUNT EQ #0
14995  052600                                  IF COUNT NE #0 THEN
14996  052600  005737  000466                  TST     COUNT
14997  052604  001402                          BEQ     $52256
14998  052606                                    INLINE <JMP $5074>
14999  052606  000137  052156                  JMP $5074
15000  052612                                  ENDIF
15001  052612                                $52256:
15002
15003                                          ;+
15004                                          ;       INLINE CASE - MULPI, USING UNSIGNED PACKED DATA
15005                                          ;-
```

```
15006
15007  052612                          CALL CLRDSB
15008  052612  004737  055520                                                          JSR     PC,CLRDSB
15009
15010                                  ;+
15011                                  ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
15012                                  ;-
15013
15014  052616                          LET R0 := #TAB89+2
15015  052616  012700  054306                                                          MOV     #TAB89+2,R0
15016  052622                          LET DATA00 := (R0)+             ;SRC1 LENGTH
15017  052622  012037  000560                                                          MOV     (R0)+,DATA00
15018  052626                          LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA
15019  052626  012037  000562                                                          MOV     (R0)+,DATA01
15020  052632                          LET DATA02 := (R0)+             ;SRC2 LENGTH
15021  052632  012037  000564                                                          MOV     (R0)+,DATA02
15022  052636                          LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA
15023  052636  012037  000566                                                          MOV     (R0)+,DATA03
15024  052642                          LET DATA04 := (R0)+             ;DEST LENGTH
15025  052642  012037  000570                                                          MOV     (R0)+,DATA04
15026  052646                          LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (PRODUCT)
15027  052646  012037  000572                                                          MOV     (R0)+,DATA05
15028
15029                                  ;+
15030                                  ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
15031                                  ;-
15032
15033  052652                          LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
15034  052652  012705  061766                                                          MOV     #CHRSET,R5
15035  052656                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
15036  052656  010546                                                          MOV     R5,-(SP)
15037  052660  013745  000560                                                  MOV     DATA00,-(R5)
15038  052664  013745  000562                                                  MOV     DATA01,-(R5)
15039  052670  012745  062370                                                  MOV     #DSBUF1,-(R5)
15040  052674  004737  055646                                                  JSR     PC,PACK
15041  052700  012605                                                          MOV     (SP)+,R5
15042  052702                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
15043  052702  010546                                                          MOV     R5,-(SP)
15044  052704  013745  000564                                                  MOV     DATA02,-(R5)
15045  052710  013745  000566                                                  MOV     DATA03,-(R5)
15046  052714  012745  062432                                                  MOV     #DSBUF2,-(R5)
15047  052720  004737  055646                                                  JSR     PC,PACK
15048  052724  012605                                                          MOV     (SP)+,R5
15049  052726                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
15050  052726  010546                                                          MOV     R5,-(SP)
15051  052730  013745  000570                                                  MOV     DATA04,-(R5)
15052  052734  013745  000572                                                  MOV     DATA05,-(R5)
15053  052740  012745  062536                                                  MOV     #DS.EXP,-(R5)
15054  052744  004737  055646                                                  JSR     PC,PACK
15055  052750  012605                                                          MOV     (SP)+,R5
15056  052752                          CALL CLRREG                     ;ENSURE GPR'S 0-5 ARE ZERO
15057  052752  004737  055330                                                  JSR     PC,CLRREG
15058
15059  052756                          INLINE <MULPI>
15060  052756  076174                                                          MULPI
15061  052760                          INLINE <.WORD TMULPI>
```

```
15062  052760  055100                          INLINE <.WORD TMULPI+4>                                  .WORD TMULPI
15063  052762
15064  052762  055104                          INLINE <.WORD TMULPI+10>                                 .WORD TMULPI+4
15065  052764
15066  052764  055110                          LET CC := PSW                                            .WORD TMULPI+10
15067  052766
15068  052766  013737  177776  000516          LET CC := CC CLR.BY #177760                              MOV     PSW,CC
15069  052774
15070  052774  042737  177760  000516          IF CC NE #0 THEN                                         BIC     #177760,CC
15071  053002
15072  053002  005737  000516                                                                           TST     CC
15073  053006  001402                                                                                   BEQ     $52257
15074  053010                                   CALL ERROR
15075  053010  004737  056274                  ENDIF                                                    JSR     PC,ERROR
15076  053014
15077  053014                                                                                $52257:
15078
15079                                           ;+
15080                                           ;       ENSURE GPR'S STILL ZERO
15081                                           ;-
15082
15083  053014                                   IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
15084  053014  005700                                                                                   TST     R0
15085  053016  001004                                                                                   BNE     $52260
15086  053020  005701                                                                                   TST     R1
15087  053022  001002                                                                                   BNE     $52260
15088  053024  005702                                                                                   TST     R2
15089  053026  001402                                                                                   BEQ     $52261
15090  053030                                                                                $52260:
15091  053030                                   CALL ERROR
15092  053030  004737  056274                  ENDIF                                                    JSR     PC,ERROR
15093  053034
15094  053034                                                                                $52261:
15095  053034                                   IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
15096  053034  005703                                                                                   TST     R3
15097  053036  001004                                                                                   BNE     $52262
15098  053040  005704                                                                                   TST     R4
15099  053042  001002                                                                                   BNE     $52262
15100  053044  005705                                                                                   TST     R5
15101  053046  001402                                                                                   BEQ     $52263
15102  053050                                                                                $52262:
15103  053050                                   CALL ERROR
15104  053050  004737  056274                  ENDIF                                                    JSR     PC,ERROR
15105  053054
15106  053054                                                                                $52263:
15107
15108                                           ;+
15109                                           ;       CHECK RESULTS
15110                                           ;-
15111
15112  053054                                   LET R0 := #DS.DST
15113  053054  012700  062474                                                                           MOV     #DS.DST,R0
15114  053060                                   LET R1 :- #DS.EXP                ;EXPECTED DATA
15115  053060  012701  062536                                                                           MOV     #DS.EXP,R1
15116  053064                                   LET R2 := TMULPI+10 CLR.BY #70000        ;GET STRING LENGTH
15117  053064  013702  055110                                                                           MOV     TMULPI+10,R2
```

```
15118  053070  042702  070000                                                                  BIC     #70000,R2
15119  053074                                                                                  ASR     R2
15120  053074  006202                                                                          ADD     #DS.EXP,R2
15121  053076                                                                                  BISB    #17,(R2)
15122  053076  062702  062536                                                                  CLR     ERRFLG
15123  053102
15124  053102  152712  000017
15125  053106
15126  053106  005037  000454
15127  053112
15128  053112                                                                          $52264:
15129  053112  020027  062533                                                                  CMP     R0,#DS.DST+37
15130  053116  001410                                                                          BEQ     $52265
15131  053120  005737  000454                                                                  TST     ERRFLG
15132  053124  001005                                                                          BNE     $52265
15133  053126
15134  053126  122021                                                                          CMPB    (R0)+,(R1)+
15135  053130  001402                                                                          BEQ     $52266
15136  053132
15137  053132  004737  056274                                                                  JSR     PC,ERROR
15138  053136
15139  053136                                                                          $52266:
15140  053136
15141  053136  000765                                                                          BR      $52264
15142  053140                                                                          $52265:
15143
15144  053140                                                                                  CIS8END:
15145  053140
15146
```

```
INLINE  <ASR    R2>             ;LENGTH/2 (PACKING FACTOR)
LET R2 := R2 + #DS.EXP          ;R2 POINTS TO MSD/SIGN
LET (R2) :B= (R2) SET.BY #17    ;MAKE IT UNSIGNED
LET ERRFLG := #0
WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO




 IFB (R0)+ NE (R1)+ THEN


  CALL ERROR
 ENDIF
ENDDO


INLINE <CIS8END:>
```

```
15147                                   ;*****************************************************************
15148                                   ;*****************************************************************
15149                                   ;++
15150                                   ;               C I S 9     M O D U L E
15151                                   ;
15152                                   ;  THIS MODULE TESTS THE PACKED DIVIDE INSTRUCTION: DIVP.
15153                                   ;--
15154                                   ;*****************************************************************
15155                                   ;*****************************************************************
15156
15157
15158
15159
15160
15161                                   .SBTTL  CIS9 INITIALIZATION
15162                                   ;*****************************************************************
15163                                   ;
15164                                   ;  CIS9 INITIALIZATION
15165                                   ;
15166                                   ;*****************************************************************
15167
15168                                   ;IF SWR<5:0> ARE CLEARED OR IF SWR<5> IS SET THEN EXECUTE
15169                                   ;  THE CIS9 MODULE; OTHERWISE, SKIP TO END OF PASS.
15170
15171  053140                           INLINE   <SCOPE>
15172  053140  000004                                                          SCOPE
15173
15174  053142                           LET TEMP0 := @SWR CLR.BY #177700
15175  053142  017737  125260  000474                                         MOV     @SWR,TEMP0
15176  053150  042737  177700  000474                                         BIC     #177700,TEMP0
15177  053156                           IF TEMP0 NE #0 THEN
15178  053156  0 5737  000474                                                 TST     TEMP0
15179  053162  001406                                                         BEQ     $52267
15180  053164                             IF #BIT5 NOTSETIN TEMP0 THEN
15181  053164  032737  000040  000474                                         BIT     #BIT5,TEMP0
15182  053172  001002                                                         BNE     $52270
15183  053174
15184  053174  000137  055114               INLINE   <JMP   CIS9END>                JMP   CIS9END
15185  053200                             ENDIF
15186  053200                                                          $52270:
15187  053200                           ENDIF
15188  053200                                                          $52267:
15189  053200
15190  053200  012737  000011  000544   LET CTL := #9.          ;CONTROL CHIP NUMBER        MOV     #9.,CTL
15191  053206
15192  053206  005037  000454           LET ERRFLG := #0        ;INITIALIZE ERROR FLAG      CLR     ERRFLG
15193  053212
15194  053212  012737  000340  177776   LET PSW := #340                             MOV     #340,PSW
15195  053220
15196  053220  012737  000001  000550   LET ERR := #1                               MOV     #1,ERR
15197
```

```
15198                                   .SBTTL  DIVP
15199                                   ;******************************
15200                                   ;+
15201                                   ;       DIVP TEST
15202                                   ;-
15203                                   ;******************************
15204
15205  053226                           INLINE <XDIVP:>                                          XDIVP:
15206  053226                           INLINE <SCOPE>                                           SCOPE
15207  053226
15208  053226  000004                   LET $TIMES := #20               ;ITERATION COUNT         MOV     #20,$TIMES
15209  053230
15210  053230  012737  000020  000404   LET COUNT := TAB89              ;# OF TEST CASES         MOV     TAB89,COUNT
15211  053236
15212  053236  013737  054304  000466   LET TSTCAS := #TAB89+2          ;POINT TO FIRST TEST CASE MOV    #TAB89+2,TSTCAS
15213  053244
15214  053244  012737  054306  000542
15215
15216                                   ;+
15217                                   ;       CLR R0.EXT TO R3.EXP
15218                                   ;-
15219
15220  053252                           INCR  R0 FROM #0 TO #6 BY #2
15221  053252  005000                                                                           CLR     R0
15222  053254  000402                                                                           BR      $52271
15223  053256                                                                          $52272:
15224  053256  062700  000002                                                                  ADD     #2,R0
15225  053262                                                                          $52271:
15226  053262  020027  000006                                                                  CMP     R0,#6
15227  053266  003003                                                                          BGT     $52273
15228  053270
15229  053270  005060  000522           INLINE <CLR R0.EXP(R0)>                                  CLR R0.EXP(R0)
15230  053274
15231  053274  000770                   ENDINC                                                   BR      $52272
15232  053276                                                                          $52273:
15233
15234  053276                           ;REPEAT OUTER LOOP FOR TEST CASES                        $5075:
15235  053276                           INLINE <$5075:>
15236  053276
15237  053276  004737  055520           CALL CLRDSB                     ;CLR DS BUFFERS          JSR     PC,CLRDSB
15238
15239                                   ;+
15240                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
15241                                   ;-
15242
15243  053302
15244  053302  013700  000542           LET R0 := TSTCAS                                         MOV     TSTCAS,R0
15245  053306
15246  053306  012037  000560           LET DATA00 := (R0)+             ;SRC1 LENGTH             MOV     (R0)+,DATA00
15247  053312
15248  053312  012037  000562           LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA    MOV     (R0)+,DATA01
15249  053316
15250  053316  012037  000564           LET DATA02 := (R0)+             ;SRC2 LENGTH             MOV     (R0)+,DATA02
15251  053322
15252  053322  012037  000566           LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA    MOV     (R0)+,DATA03
15253  053326                           LET DATA04 := (R0)+             ;DEST LENGTH
```

```
15254  053326  012037  000570                                                          MOV     (R0)+,DATA04
15255  053332
15256  053332  012037  000572                                                          MOV     (R0)+,DATA05
15257  053336
15258  053336  012037  000520                                                          MOV     (R0)+,CC.EXP
15259  053342
15260  053342  012037  000572                                                          MOV     (R0)+,DATA05
15261  053346
15262  053346  012037  000520                                                          MOV     (R0)+,CC.EXP
15263
15264                                  ;+
15265                                  ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
15266                                  ;-
15267
15268  053352                          LET R5 := #CHRSET                       ;R5 IS OPERAND STACK FOR ROUTINE
15269  053352  012705  061766                                                          MOV     #CHRSET,R5
15270  053356                          CALL PACK IN <#DSBUF1,DATA01,DATA00>    ;SRC1
15271  053356  010546                                                          MOV     R5,-(SP)
15272  053360  013745  000560                                                  MOV     DATA00,-(R5)
15273  053364  013745  000562                                                  MOV     DATA01,-(R5)
15274  053370  012745  062370                                                  MOV     #DSBUF1,-(R5)
15275  053374  004737  055646                                                  JSR     PC,PACK
15276  053400  012605                                                          MOV     (SP)+,R5
15277  053402                          CALL PACK IN <#DSBUF2,DATA03,DATA02>    ;SRC2
15278  053402  010546                                                          MOV     R5,-(SP)
15279  053404  013745  000564                                                  MOV     DATA02,-(R5)
15280  053410  013745  000566                                                  MOV     DATA03,-(R5)
15281  053414  012745  062432                                                  MOV     #DSBUF2,-(R5)
15282  053420  004737  055646                                                  JSR     PC,PACK
15283  053424  012605                                                          MOV     (SP)+,R5
15284  053426                          CALL PACK IN <#DS.EXP,DATA05,DATA04>    ;DEST
15285  053426  010546                                                          MOV     R5,-(SP)
15286  053430  013745  000570                                                  MOV     DATA04,-(R5)
15287  053434  013745  000572                                                  MOV     DATA05,-(R5)
15288  053440  012745  062536                                                  MOV     #DS.EXP,-(R5)
15289  053444  004737  055646                                                  JSR     PC,PACK
15290  053450  012605                                                          MOV     (SP)+,R5
15291
15292
15293                                  ;+
15294                                  ;       LOAD GPR'S FROM DATAXX & ADD DATA TYPE
15295                                  ;-
15296
15297  053452                          LET R0 := DATA00 SET.BY #60000
15298  053452  013700  000560                                                  MOV     DATA00,R0
15299  053456  052700  060000                                                  BIS     #60000,R0
15300  053462                          LET R1 := #DSBUF1
15301  053462  012701  062370                                                  MOV     #DSBUF1,R1
15302  053466                          LET R2 := DATA02 SET.BY #60000
15303  053466  013702  000564                                                  MOV     DATA02,R2
15304  053472  052702  060000                                                  BIS     #60000,R2
15305  053476                          LET R3 := #DSBUF2
15306  053476  012703  062432                                                  MOV     #DSBUF2,R3
15307  053502                          LET R4 := DATA04 SET.BY #60000
15308  053502  013704  000570                                                  MOV     DATA04,R4
15309  053506  052704  060000                                                  BIS     #60000,R4
```

```
15310  053512                          LET R5 := #DS.DST
15311  053512  012705  062474                                          MOV     #DS.DST,R5
15312
15313                                  ;+
15314                                  ;       FINISH SET UP & DO CIS INSTRUCTION
15315                                  ;-
15316
15317
15318  053516                          LET R4.EXP := R4
15319  053516  010437  000532                                          MOV     R4,R4.EXP
15320  053522                          LET R5.EXP := R5
15321  053522  010537  000534                                          MOV     R5,R5.EXP
15322  053526                          INLINE <DIVP>
15323  053526  076075                                                  DIVP
15324
15325                                  ;+
15326                                  ;       CHECK CONDITION CODES AND GPR'S FOR CORRECT RESULTS.
15327                                  ;-
15328
15329  053530                          LET CC := PSW
15330  053530  013737  177776  000516                                  MOV     PSW,CC
15331  053536                          LET CC := CC CLR.BY #177760
15332  053536  042737  177760  000516                                  BIC     #177760,CC
15333  053544                          IF CC NE CC.EXP THEN
15334  053544  023737  000516  000520                                  CMP     CC,CC.EXP
15335  053552  001402                                                  BEQ     $52274
15336  053554                            CALL ERROR
15337  053554  004737  056274                                          JSR     PC,ERROR
15338  053560                          ENDIF
15339  053560                                                  $52274:
15340  053560                          IF R0 NE R0.EXP THEN
15341  053560  020037  000522                                          CMP     R0,R0.EXP
15342  053564  001402                                                  BEQ     $52275
15343  053566                            CALL ERROR
15344  053566  004737  056274                                          JSR     PC,ERROR
15345  053572                          ENDIF
15346  053572                                                  $52275:
15347  053572                          IF R1 NE R1.EXP THEN
15348  053572  020137  000524                                          CMP     R1,R1.EXP
15349  053576  001402                                                  BEQ     $52276
15350  053600                            CALL ERROR
15351  053600  004737  056274                                          JSR     PC,ERROR
15352  053604                          ENDIF
15353  053604                                                  $52276:
15354  053604                          IF R2 NE R2.EXP THEN
15355  053604  020237  000526                                          CMP     R2,R2.EXP
15356  053610  001402                                                  BEQ     $52277
15357  053612                            CALL ERROR
15358  053612  004737  056274                                          JSR     PC,ERROR
15359  053616                          ENDIF
15360  053616                                                  $52277:
15361  053616                          IF R3 NE R3.EXP THEN
15362  053616  020337  000530                                          CMP     R3,R3.EXP
15363  053622  001402                                                  BEQ     $52300
15364  053624                            CALL ERROR
15365  053624  004737  056274                                          JSR     PC,ERROR
```

```
15366  053630                          ENDIF
15367  053630
15368  053630                          IF R4 NE R4.EXP THEN
15369  053630  020437  000532                                          $52300:
15370  053634  001402                                                          CMP     R4,R4.EXP
15371  053636                            CALL ERROR                            BEQ     $52301
15372  053636  004737  056274                                                 JSR     PC,ERROR
15373  053642                          ENDIF
15374  053642                                                          $52301:
15375  053642                          IF R5 NE R5.EXP THEN
15376  053642  020537  000534                                                 CMP     R5,R5.EXP
15377  053646  001402                                                          BEQ     $52302
15378  053650                            CALL ERROR
15379  053650  004737  056274                                                 JSR     PC,ERROR
15380  053654                          ENDIF
15381  053654                                                          $52302:
15382
15383
15384                                   ;+
15385                                   ;       CHECK RESULTS VS EXPECTED RESULTS
15386                                   ;-
15387
15388  053654                          LET R0 := #DS.DST
15389  053654  012700  062474                                                 MOV     #DS.DST,R0
15390  053660                          LET R1 := #DS.EXP
15391  053660  012701  062536                                                 MOV     #DS.EXP,R1
15392  053664                          LET ERRFLG := #0
15393  053664  005037  000454                                                 CLR     ERRFLG
15394  053670                          WHILE R0 NE #DS.DST+40 AND ERRFLG EQ #0 DO
15395  053670                                                          $52303:
15396  053670  020027  062534                                                 CMP     R0,#DS.DST+40
15397  053674  001410                                                          BEQ     $52304
15398  053676  005737  000454                                                 TST     ERRFLG
15399  053702  001005                                                          BNE     $52304
15400  053704
15401  053704  122021                    IFB (R0)+ NE (R1)+ THEN               CMPB    (R0)+,(R1)+
15402  053706  001402                                                          BEQ     $52305
15403  053710
15404  053710  004737  056274              CALL ERROR                          JSR     PC,ERROR
15405  053714                            ENDIF
15406  053714                                                          $52305:
15407  053714                          ENDDO
15408  053714  000765                                                          BR      $52303
15409  053716                                                          $52304:
15410  053716
15411  053716  062737  000022  000542    LET TSTCAS := TSTCAS + #22             ADD     #22,TSTCAS
15412  053724
15413  053724  005337  000466            LET COUNT := COUNT - #1               DEC     COUNT
15414
15415  053730                          ;UNTIL COUNT EQ #0
15416  053730  005737  000466          IF COUNT NE #0 THEN                   TST     COUNT
15417  053734  001402                                                          BEQ     $52306
15418  053736
15419  053736  000137  053276            INLINE <JMP $5075>                  JMP $5075
15420  053742                          ENDIF
15421  053742                                                          $52306:
```

```
15422
15423                                   ;+
15424                                   ;       INLINE CASE - DIVPI, USING UNSIGNED PACKED DATA
15425                                   ;-
15426
15427  053742                           CALL CLRDSB
15428  053742  004737  055520                                                  JSR     PC,CLRDSB
15429
15430                                   ;+
15431                                   ;       LOAD DATAXX AND CC.EXP FROM TEST CASE
15432                                   ;-
15433
15434  053746                           LET R0 := #TAB89+2
15435  053746  012700  054306                                                  MOV     #TAB89+2,R0
15436  053752                           LET DATA00 := (R0)+             ;SRC1 LENGTH
15437  053752  012037  000560                                                  MOV     (R0)+,DATA00
15438  053756                           LET DATA01 := (R0)+             ;POINTER TO SRC1 DATA
15439  053756  012037  000562                                                  MOV     (R0)+,DATA01
15440  053762                           LET DATA02 := (R0)+             ;SRC2 LENGTH
15441  053762  012037  000564                                                  MOV     (R0)+,DATA02
15442  053766                           LET DATA03 := (R0)+             ;POINTER TO SRC2 DATA
15443  053766  012037  000566                                                  MOV     (R0)+,DATA03
15444  053772                           LET DATA04 := (R0)+             ;DEST LENGTH
15445  053772  012037  000570                                                  MOV     (R0)+,DATA04
15446  053776                           LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (PRODUCT)
15447  053776  012037  000572                                                  MOV     (R0)+,DATA05
15448  054002                           LET CC.EXP := (R0)+
15449  054002  012037  000520                                                  MOV     (R0)+,CC.EXP
15450  054006                           LET DATA05 := (R0)+             ;POINTER TO DS.EXP DATA (QUOTIENT)
15451  054006  012037  000572                                                  MOV     (R0)+,DATA05
15452
15453                                   ;+
15454                                   ;       PACK BUFFERS FOR SRC1,SRC2, & DEST
15455                                   ;-
15456
15457  054012                           LET R5 := #CHRSET                      ;R5 IS OPERAND STACK FOR ROUTINE
15458  054012  012705  061766                                                  MOV     #CHRSET,R5
15459  054016                           CALL PACK IN <#DSBUF1,DATA01,DATA00>   ;SRC1
15460  054016  010546                                                          MOV     R5,-(SP)
15461  054020  013745  000560                                                  MOV     DATA00,-(R5)
15462  054024  013745  000562                                                  MOV     DATA01,-(R5)
15463  054030  012745  062370                                                  MOV     #DSBUF1,-(R5)
15464  054034  004737  055646                                                  JSR     PC,PACK
15465  054040  012605                                                          MOV     (SP)+,R5
15466  054042                           CALL PACK IN <#DSBUF2,DATA03,DATA02>   ;SRC2
15467  054042  010546                                                          MOV     R5,-(SP)
15468  054044  013745  000564                                                  MOV     DATA02,-(R5)
15469  054050  013745  000566                                                  MOV     DATA03,-(R5)
15470  054054  012745  062432                                                  MOV     #DSBUF2,-(R5)
15471  054060  004737  055646                                                  JSR     PC,PACK
15472  054064  012605                                                          MOV     (SP)+,R5
15473  054066                           CALL PACK IN <#DS.EXP,DATA05,DATA04>   ;DEST
15474  054066  010546                                                          MOV     R5,-(SP)
15475  054070  013745  000570                                                  MOV     DATA04,-(R5)
15476  054074  013745  000572                                                  MOV     DATA05,-(R5)
15477  054100  012745  062536                                                  MOV     #DS.EXP,-(R5)
```

```
15478  054104  004737  055646                                                  JSR     PC,PACK
15479  054110  012605                                                          MOV     (SP)+,R5
15480  054112
15481  054112  004737  055330          CALL CLRREG                 ;ENSURE GPR'S 0-5 ARE ZERO
                                                                               JSR     PC,CLRREG
15482
15483  054116                          INLINE <DIVPI>                          DIVPI
15484  054116  076175                  INLINE <.WORD TMULPI>                   .WORD TMULPI
15485  054120
15486  054120  055100                  INLINE <.WORD TMULPI+4>                 .WORD TMULPI+4
15487  054122
15488  054122  055104                  INLINE <.WORD TMULPI+10>                .WORD TMULPI+10
15489  054124
15490  054124  055110                  LET CC := PSW                           MOV     PSW,CC
15491  054126
15492  054126  013737  177776  000516  LET CC := CC CLR.BY #177760            BIC     #177760,CC
15493  054134
15494  054134  042737  177760  000516  IF CC NE #0 THEN                       TST     CC
15495  054142                                                                 BEQ     $52307
15496  054142  005737  000516
15497  054146  001402
15498  054150          CALL ERROR                                             JSR     PC,ERROR
15499  054150  004737  056274
15500  054154          ENDIF
15501  054154                                                          $52307:
15502
15503                  ;+
15504                  ;       ENSURE GPR'S STILL ZERO
15505                  ;-
15506
15507  054154          IF R0 NE #0 OR R1 NE #0 OR R2 NE #0 THEN
15508  054154  005700                                                          TST     R0
15509  054156  001004                                                          BNE     $52310
15510  054160  005701                                                          TST     R1
15511  054162  001002                                                          BNE     $52310
15512  054164  005702                                                          TST     R2
15513  054166  001402                                                          BEQ     $52311
15514  054170                                                          $52310:
15515  054170          CALL ERROR
15516  054170  004737  056274                                                  JSR     PC,ERROR
15517  054174          ENDIF
15518  054174                                                          $52311:
15519  054174          IF R3 NE #0 OR R4 NE #0 OR  R5 NE #0 THEN
15520  054174  005703                                                          TST     R3
15521  054176  001004                                                          BNE     $52312
15522  054200  005704                                                          TST     R4
15523  054202  001002                                                          BNE     $52312
15524  054204  005705                                                          TST     R5
15525  054206  001402                                                          BEQ     $52313
15526  054210                                                          $52312:
15527  054210          CALL ERROR
15528  054210  004737  056274                                                  JSR     PC,ERROR
15529  054214          ENDIF
15530  054214                                                          $52313:
15531
15532                  ;+
15533                  ;       CHECK RESULTS
```

```
15534
15535
15536  054214
15537  054214  012700  062474          ;-
15538  054220
15539  054220  012701  062536          LET R0 := #DS.DST                                       MOV     #DS.DST,R0
15540  054224
15541  054224  013702  055110          LET R1 := #DS.EXP               ;EXPECTED DATA          MOV     #DS.EXP,R1
15542  054230  042702  070000
15543  054234                           LET R2 := TMULPI+10 CLR.BY #70000       ;GET STRING LENGTH
15544  054234  006202                                                                           MOV     TMULPI+10,R2
15545  054236                                                                                   BIC     #70000,R2
15546  054236  062702  062536          INLINE  <ASR    R2>             ;LENGTH/2 (PACKING FACTOR)
15547  054242                                                                                   ASR     R2
15548  054242  152712  000017          LET R2 := R2 + #DS.EXP          ;R2 POINTS TO MSD/SIGN
15549  054246                                                                                   ADD     #DS.EXP,R2
15550  054246  005037  000454          LET (R2) :B= (R2) SET.BY #17    ;MAKE IT UNSIGNED
15551  054252                                                                                   BISB    #17,(R2)
15552  054252                           LET ERRFLG := #0                                        CLR     ERRFLG
15553  054252  020027  062533          WHILE R0 NE #DS.DST+37 AND ERRFLG EQ #0 DO
15554  054256  001410                                                           $52314:
15555  054260  005737  000454                                                                  CMP     R0,#DS.DST+37
15556  054264  001005                                                                           BEQ     $52315
15557  054266                                                                                   TST     ERRFLG
15558  054266  122021                    IFB (R0)+ NE (R1)+ THEN                               BNE     $52315
15559  054270  001402
15560  054272                                                                                   CMPB    (R0)+,(R1)+
15561  054272  004737  056274            CALL ERROR                                            BEQ     $52316
15562  054276                                                                                   JSR     PC,ERROR
15563  054276                           ENDIF
15564  054276                                                                   $52316:
15565  054276  000765                   ENDDO                                                   BR      $52314
15566  054300
15567  054300                                                                   $52315:
15568  054300  000137  055114          INLINE <JMP CIS9END>                                    JMP CIS9END
15569
```

```
15570                                   .SBTTL  TEST CASES FOR CIS8 & CIS9
15571
15572  054304  000007                   TAB89:  .WORD   7               ;# OF TEST CASES
15573
15574  054306  000017                           .WORD   15.             ;SRC1 LENGTH
15575  054310  054504                           .WORD   MUL1            ;SRC1 PTR
15576  054312  000021                           .WORD   17.             ;SRC2 LENGTH
15577  054314  054526                           .WORD   MUL1A           ;SRC2 PTR
15578  054316  000037                           .WORD   31.             ;DEST LENGTH
15579  054320  054552                           .WORD   MUL1B           ;DEST PTR (PRODUCT)
15580  054322  000000                           .WORD   0               ;CC.EXP (PRODUCT)
15581  054324  054614                           .WORD   MUL1C           ;DEST PTR (QUOTIENT)
15582  054326  000000                           .WORD   0               ;CC.EXP (QUOTIENT)
15583
15584  054330  000004                           .WORD   4
15585  054332  054656                           .WORD   MUL2
15586  054334  000007                           .WORD   7
15587  054336  054664                           .WORD   MUL2A
15588  054340  000013                           .WORD   11.
15589  054342  054676                           .WORD   MUL2B
15590  054344  000010                           .WORD   10
15591  054346  054714                           .WORD   MUL2C
15592  054350  000010                           .WORD   10
15593
15594  054352  000005                           .WORD   5
15595  054354  054732                           .WORD   MUL3
15596  054356  000002                           .WORD   2
15597  054360  054742                           .WORD   MUL3A
15598  054362  000006                           .WORD   6
15599  054364  054746                           .WORD   MUL3B
15600  054366  000000                           .WORD   0
15601  054370  054756                           .WORD   MUL3C
15602  054372  000004                           .WORD   4
15603
15604  054374  000005                           .WORD   5
15605  054376  054766                           .WORD   MUL4
15606  054400  000001                           .WORD   1
15607  054402  054776                           .WORD   MUL4A
15608  054404  000001                           .WORD   1
15609  054406  055002                           .WORD   MUL4B
15610  054410  000004                           .WORD   4
15611  054412  055006                           .WORD   MUL4C
15612  054414  000004                           .WORD   4
15613
15614  054416  000002                           .WORD   2
15615  054420  055012                           .WORD   MUL5
15616  054422  000005                           .WORD   5
15617  054424  055016                           .WORD   MUL5A
15618  054426  000000                           .WORD   0
15619  054430  055026                           .WORD   MUL5B
15620  054432  000006                           .WORD   6
15621  054434  055032                           .WORD   MUL5C
15622  054436  000006                           .WORD   6
15623
15624  054440  000005                           .WORD   5
15625  054442  054766                           .WORD   MUL4
```

```
15626  054444  000001                          .WORD   1
15627  054446  054776                          .WORD   MUL4A
15628  054450  000004                          .WORD   4
15629  054452  055002                          .WORD   MUL4B
15630  054454  000004                          .WORD   4
15631  054456  055006                          .WORD   MUL4C
15632  054460  000004                          .WORD   4
15633
15634  054462  000005                          .WORD   5
15635  054464  055036                          .WORD   MUL7
15636  054466  000004                          .WORD   4
15637  054470  055046                          .WORD   MUL7A
15638  054472  000010                          .WORD   8.
15639  054474  055054                          .WORD   MUL7B
15640  054476  000000                          .WORD   0
15641  054500  055066                          .WORD   MUL7C
15642  054502  000004                          .WORD   4
15643
15644  054504  000000                  MUL1:   .WORD   0
15645  054506     004     004     004          .BYTE   4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4
15646  054511     004     004     004
15647  054514     004     004     004
15648  054517     004     004     004
15649  054522     004     004     004
15650          054526                          .EVEN
15651
15652  054526  000000                  MUL1A:  .WORD   0
15653  054530     001     007     004          .BYTE   1,7,4,3,2,1,6,9.,.5,3,4,7,9.,.4,1,6,2
15654  054533     003     002     001
15655  054536     006     011     005
15656  054541     003     004     007
15657  054544     011     004     001
15658  054547     006     002
15659          054552                          .EVEN
15660
15661  054552  000000                  MUL1B:  .WORD   0
15662  054554     007     007     004          .BYTE   7,7,4,7,6,3,0,9.,.0,4,3,5,2,9.,.5,3
15663  054557     007     006     003
15664  054562     000     011     000
15665  054565     004     003     005
15666  054570     002     011     005
15667  054573     003
15668  054574     001     004     001          .BYTE   1,4,1,2,5,7,9.,.8.,.4,5,3,5,9.,.2,8.
15669  054577     002     005     007
15670  054602     011     010     004
15671  054605     005     003     005
15672  054610     011     002     010
15673          054614                          .EVEN
15674
15675  054614  000000                  MUL1C:  .WORD   0
15676  054616     000     000     000          .BYTE   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
15677  054621     000     000     000
15678  054624     000     000     000
15679  054627     000     000     000
15680  054632     000     000     000
15681  054635     000
```

```
15682  054636    000     000     000          .BYTE   0,0,0,0,0,0,0,0,0,0,0,0,0,3,9.
15683  054641    000     000     000
15684  054644    000     000     000
15685  054647    000     000     000
15686  054652    000     003     011
15687            054656                       .EVEN
15688
15689  054656  177777                 MUL2:   .WORD   -1
15690  054660    002     007     004          .BYTE   2,7,4,1
15691  054663    001
15692                                          .EVEN
15693
15694  054664  000000                 MUL2A:  .WORD   0
15695  054666    010     004     006          .BYTE   8.,4,6,2,9.,7,3
15696  054671    002     011     007
15697  054674    003
15698            054676                       .EVEN
15699  054676  177777                 MUL2B:  .WORD   -1
15700  054700    002     003     001          .BYTE   2,3,1,9.,7,0,0,8.,9.,9.,3
15701  054703    011     007     000
15702  054706    000     010     011
15703  054711    011     003
15704            054714                       .EVEN
15705
15706  054714  177777                 MUL2C:  .WORD   -1
15707  054716    000     000     000          .BYTE   0,0,0,0,0,0,0,3,0,8.,7
15708  054721    000     000     000
15709  054724    000     003     000
15710  054727    010     007
15711            054732                       .EVEN
15712
15713  054732  177777                 MUL3:   .WORD   -1
15714  054734    004     001     007          .BYTE   4,1,7,3,9.
15715  054737    003     011
15716            054742                       .EVEN
15717
15718  054742  177777                 MUL3A:  .WORD   -1
15719  054744    001     001                  .BYTE   1,1
15720                                          .EVEN
15721
15722  054746  000000                 MUL3B:  .WORD   0
15723  054750    004     005     011          .BYTE   4,5,9.,1,2,9.
15724  054753    001     002     011
15725                                          .EVEN
15726
15727  054756  000000                 MUL3C:  .WORD   0
15728  054760    000     000     000          .BYTE   0,0,0,0,0,0
15729  054763    000     000     000
15730                                          .EVEN
15731
15732  054766  000000                 MUL4:   .WORD   0
15733  054770    001     007     003          .BYTE   1,7,3,5,4
15734  054773    005     004
15735            054776                       .EVEN
15736
15737  054776  000000                 MUL4A:  .WORD   0
```

```
 15738  055000     000                          .BYTE   0
 15739             055002                       .EVEN
 15740
 15741  055002     000000              MUL4B:   .WORD   0
 15742  055004     000                          .BYTE   0
 15743             055006                       .EVEN
 15744
 15745  055006     000000              MUL4C:   .WORD   0
 15746  055010     000                          .BYTE   0
 15747             055012                       .EVEN
 15748
 15749  055012     000000              MUL5:    .WORD   0
 15750  055014     001      007                 .BYTE   1,7
 15751                                           .EVEN
 15752
 15753  055016     000000              MUL5A:   .WORD   0
 15754  055020     005      002      000        .BYTF   5,2,0,0,0
 15755  055023     000      000
 15756             055026                       .EVEN
 15757
 15758  055026     000000              MUL5B:   .WORD   0
 15759  055030     000                          .BYTE   0
 15760             055032                       .EVEN
 15761
 15762  055032     000000              MUL5C:   .WORD   0
 15763  055034     000                          .BYTE   0
 15764             055036                       .EVEN
 15765
 15766                                 ;MUL6    USES THE MUL4 STRINGS
 15767
 15768  055036     000000              MUL7:    .WORD   0
 15769  055040     001      000      000        .BYTE   1,0,0,0,0
 15770  055043     000      000
 15771             055046                       .EVEN
 15772  055046     000000              MUL7A:   .WORD   0
 15773  055050     001      000      000        .BYTE   1,0,0,1
 15774  055053     001
 15775                                           .EVEN
 15776  055054     000000              MUL7B:   .WORD   0
 15777  055056     001      000      000        .BYTE   1,0,0,1,0,0,0,0
 15778  055061     001      000      000
 15779  055064     000      000
 15780                                           .EVEN
 15781  055066     000000              MUL7C:   .WORD   0
 15782  055070     000      000      000        .BYTE   0,0,0,0,0,0,0,0
 15783  055073     000      000      000
 15784  055076     000      000
 15785                                           .EVEN
 15786
 15787
 15788                                 ;+
 15789                                 ;       INLINE TEST CASE FOR MULP & DIVP
 15790                                 ;-
 15791
 15792  055100     070017              TMULPI:  .WORD   070017
 15793  055102     062370                       .WORD   #DSBUF1
```

```
 15794  055104  070021                          .WORD   070021
 15795  055106  062432                          .WORD   #DSBUF2
 15796  055110  070037                          .WORD   070037
 15797  055112  062474                          .WORD   #DS.DST
 15798
 15799
 15800  055114                          CIS9END:
 15801
 15802
```

```
15803                                   .ABS
15804                                   ;;*****************************************************************
15805                                   .SBTTL  END OF PASS ROUTINE
15806                                   ;;*****************************************************************
15807                                   ;*INCREMENT THE PASS NUMBER ($PASS)
15808                                   ;*TYPE 'END PASS #XXXXX'' (WHERE XXXXX IS A DECIMAL NUMBER)
15809                                   ;*IF THERES A MONITOR GO TO IT
15810                                   ;*IF THERE ISN'T JUMP TO BEGIN
15811
15812  055114                           $EOP:
15813  055114  000004                          SCOPE
15814  055116  005037  000402                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
15815  055122  005037  000404                  CLR     $TIMES
15816  055126  005237  000636                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
15817  055132  042737  100000  000636        BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
15818  055140  005337  055230                  DEC     $EOPCT          ;;LOOP?
15819  055144  003027                          BGT     $DOAGN          ;;YES
15820  055146  013737  055232  055230        MOV     $ENDCT,$EOPCT   ;;RESTORE COUNTER
15821  055154  012737  055237  000546        MOV     #$ENDMG,MSGADR
15822  055162  104401                          TYPE                    ;;TYPE 'END PASS #''
15823  055164  013746  000636                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
15824  055170  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII, NO LEADING ZEROES
15825  055172     006                          .BYTE   6
15826  055173     000                          .BYTE   0
15827  055174  013737  055234  000546        MOV     $ENULL,MSGADR
15828  055202  104401                          TYPE                    ;;TYPE A NULL CHARACTER
15829  055204  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
15830  055210  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
15831  055212  000005                          RESET                   ;;CLEAR THE WORLD
15832  055214  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
15833  055216  000240                          NOP                     ;;SAVE ROOM
15834  055220  000240                          NOP                     ;;FOR
15835  055222  000240                          NOP                     ;;ACT11
15836  055224                           $DOAGN:
15837  055224  000137  001510                  JMP     BEGIN           ;;RETURN
15838  055230  000001                  $EOPCT: .WORD   1
15839  055232  000001                  $ENDCT: .WORD   1
15840  055234     377     377     000  $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
15841  055237     015  042412  042116  $ENDMG: .ASCIZ  <15><12>/END PASS #/
15842  055244  050040  051501  020123
15843  055252  000043
15844
15845
15846                                   ;;*****************************************************************
15847                                   ; TABLE OF SIGN/DIGIT COMBINATIONS FOR OVERPUNCH
15848                                   ;;*****************************************************************
15849  055254     173                  OVPNCH: .BYTE   173             ; +0
15850  055255     101                          .BYTE   101             ; +1
15851  055256     102                          .BYTE   102             ; +2
15852  055257     103                          .BYTE   103             ; +3
15853  055260     104                          .BYTE   104             ; +4
15854  055261     105                          .BYTE   105             ; +5
15855  055262     106                          .BYTE   106             ; +6
15856  055263     107                          .BYTE   107             ; +7
15857  055264     110                          .BYTE   110             ; +8
15858  055265     111                          .BYTE   111             ; +9
```

```
15859  055266      175                              .BYTE   175             ; -0
15860  055267      112                              .BYTE   112             ; -1
15861  055270      113                              .BYTE   113             ; -2
15862  055271      114                              .BYTE   114             ; -3
15863  055272      115                              .BYTE   115             ; -4
15864  055273      116                              .BYTE   116             ; -5
15865  055274      117                              .BYTE   117             ; -6
15866  055275      120                              .BYTE   120             ; -7
15867  055276      121                              .BYTE   121             ; -8
15868  055277      122                              .BYTE   122             ; -9
15869
15870
15871                                  ;;*****************************************************************
15872                                  .SBTTL  UNEXPECTED TIME-OUT TRAP ROUTINE
15873                                  ;;*****************************************************************
15874                                  ;*ANY UNEXPECTED TIME-OUT TRAP WILL END UP HERE
15875                                  ;*
15876
15877  055300  012737  060466  000546  TIMOUT: MOV     #TIMMSG,MSGADR          ;TYPE OUT ERROR MESSAGE
15878  055306  104401                          TYPE
15879  055310  000000                          HALT
15880  055312  000002                          RTI
15881
15882
15883                                  ;;*****************************************************************
15884                                  .SBTTL  ILLEGAL/RESERVED INSTRUCTION TRAP ROUTINE
15885                                  ;;*****************************************************************
15886                                  ;*ANY ILLEGAL OR RESERVED INSTRUCTION TRAPS WILL END UP HERE.
15887                                  ;*
15888
15889  055314  012737  060534  000546  ILLRES: MOV     #ILLMSG,MSGADR          ;TYPE OUT ERROR MESSAGE
15890  055322  104401                          TYPE
15891  055324  000000                          HALT
15892  055326  000002                          RTI
15893
15894
15895                                  ;;*****************************************************************
15896                                  .SBTTL  CLEAR REGISTERS R0 - R5 ROUTINE
15897                                  ;;*****************************************************************
15898                                  ;*THIS ROUTINE CLEARS GENERAL PURPOSE REGISTERS R0 THROUGH R5.
15899                                  ;*
15900
15901  055330                          ROUTINE  CLRREG
15902  055330                                                                  CLRREG:
15903  055330                          LET R0 := #0
15904  055330  005000                                                                 CLR     R0
15905  055332                          LET R1 := #0
15906  055332  005001                                                                 CLR     R1
15907  055334                          LET R2 := #0
15908  055334  005002                                                                 CLR     R2
15909  055336                          LET R3 := #0
15910  055336  005003                                                                 CLR     R3
15911  055340                          LET R4 := #0
15912  055340  005004                                                                 CLR     R4
15913  055342                          LET R5 := #0
15914  055342  005005                                                                 CLR     R5
```

```
15915  055344                          ENDRTN
15916  055344                                                                  $52317:
15917  055344                                                                  $52320:
15918  055344  000207                                                                 RTS     PC
15919
15920
15921
15922
15923                                  ;;*****************************************************************
15924                                  .SBTTL  CLEAR BUFFER ROUTINE
15925                                  ;;*****************************************************************
15926                                  ;*THIS ROUTINE CLEARS A 100 BYTE BUFFER WHOSE STARTING ADDRESS
15927                                  ;*HAS BEEN PUT INTO 'BFADRS'.
15928                                  ;*
15929
15930  055346                          ROUTINE  CLRBUF
15931  055346                                                                  CLRBUF:
15932  055346                          LET SAVR0 := R0
15933  055346  010037  000576                                                         MOV     R0,SAVR0
15934  055352
15935  055352  010137  000600         LET SAVR1 := R1                                 MOV     R1,SAVR1
15936  055356
15937  055356  013700  000540         LET R0 := BFADRS                                MOV     BFADRS,R0
15938  055362
15939  055362  012701  000040         LET R1 := #40                                   MOV     #40,R1
15940  055366                          REPEAT
15941  055366                                                                  $52323:
15942  055366
15943  055366  005020                      LET (R0)+ := #0                            CLR     (R0)+
15944  055370
15945  055370  005301                      LET R1 := R1 - #1                          DEC     R1
15946  055372                          UNTIL R1 EQ #0
15947  055372  005701                                                                 TST     R1
15948  055374  001374                                                                 BNE     $52323
15949  055376
15950  055376  013700  000576         LET R0 := SAVR0                                 MOV     SAVR0,R0
15951  055402
15952  055402  013701  000600         LET R1 := SAVR1                                 MOV     SAVR1,R1
15953  055406                          ENDRTN
15954  055406                                                                  $52321:
15955  055406                                                                  $52322:
15956  055406  000207                                                                 RTS     PC
15957
15958
15959
15960                                  ;;*****************************************************************
15961                                  .SBTTL  SET BUFFER ROUTINE
15962                                  ;;*****************************************************************
15963                                  ;*THIS ROUTINE SETS ALL BITS IN A 100 BYTE BUFFER WHOSE STARTING
15964                                  ;*ADDRESS HAS BEEN PUT INTO 'BFADRS'.
15965                                  ;*
15966
15967  055410                          ROUTINE  SETBUF
15968  055410                                                                  SETBUF:
15969  055410                          LET SAVR0 := R0
15970  055410  010037  000576                                                         MOV     R0,SAVR0
```

```
15971  055414                          LET SAVR1 := R1                                  MOV     R1,SAVR1
15972  055414  010137  000600
15973  055420                          LET R0 := BFADRS                                 MOV     BFADRS,R0
15974  055420  013700  000540
15975  055424                          LET R1 := #40                                    MOV     #40,R1
15976  055424  012701  000040
15977  055430                          REPEAT
15978  055430                                                                    $52326:
15979  055430                              LET (R0)+ := #177777
15980  055430  012720  177777                                                          MOV     #177777,(R0)+
15981  055434                              LET R1 := R1 - #1
15982  055434  005301                                                                  DEC     R1
15983  055436                          UNTIL R1 EQ #0
15984  055436  005701                                                                  TST     R1
15985  055440  001373                                                                  BNE     $52326
15986  055442
15987  055442  013700  000576          LET R0 := SAVR0                                  MOV     SAVR0,R0
15988  055446                          LET R1 := SAVR1                                  MOV     SAVR1,R1
15989  055446  013701  000600
15990  055452                          ENDRTN
15991  055452                                                                    $52324:
15992  055452                                                                    $52325:
15993  055452  000207                                                                  RTS     PC
15994
15995
15996
15997                                   ;;*****************************************************************
15998                                   .SBTTL  ONES AND ZEROES BUFFER ROUTINE
15999                                   ;;*****************************************************************
16000                                   ;*THIS ROUTINE SETS AN ALTERNATING ONES AND ZEROES PATTERN IN A 100 BYTE
16001                                   ;*BUFFER WHOSE STARTING ADDRESS HAS BEEN PUT INTO 'BFADRS'.
16002                                   ;*
16003
16004  055454                          ROUTINE  ALTBUF                           ALTBUF:
16005  055454
16006  055454
16007  055454  010037  000576          LET SAVR0 := R0                                  MOV     R0,SAVR0
16008  055460
16009  055460  010137  000600          LET SAVR1 := R1                                  MOV     R1,SAVR1
16010  055464
16011  055464  013700  000540          LET R0 := BFADRS                                 MOV     BFADRS,R0
16012  055470
16013  055470  012701  000040          LET R1 := #40                                    MOV     #40,R1
16014  055474                          REPEAT
16015  055474                                                                    $52331:
16016  055474
16017  055474  012720  125252              LET (R0)+ := #125252                         MOV     #125252,(R0)+
16018  055500
16019  055500  005301                      LET R1 := R1 - #1                            DEC     R1
16020  055502                          UNTIL R1 EQ #0
16021  055502  005701                                                                  TST     R1
16022  055504  001373                                                                  BNE     $52331
16023  055506
16024  055506  013700  000576          LET R0 := SAVR0                                  MOV     SAVR0,R0
16025  055512                          LET R1 := SAVR1                                  MOV     SAVR1,R1
16026  055512  013701  000600
```

```
16027  055516                          ENDRTN
16028  055516                                                                  $52327:
16029  055516                                                                  $52330:
16030  055516  000207                                                                  RTS     PC
16031
16032
16033
16034
16035                                  ;;**********************************************************************
16036                                  .SBTTL  CLEAR DECIMAL STRING BUFFERS ROUTINE
16037                                  ;;**********************************************************************
16038                                  ;*THIS ROUTINE CLEARS ALL BITS IN THE FOUR 40-BYTE DECIMAL
16039                                  ;*STRING BUFFERS.
16040                                  ;*
16041
16042  055520                          ROUTINE  CLRDSB
16043  055520                                                                  CLRDSB:
16044  055520                          LET SAVR0 := R0
16045  055520  010037  000576                                                         MOV     R0,SAVR0
16046  055524                          LET SAVR1 := R1
16047  055524  010137  000600                                                         MOV     R1,SAVR1
16048  055530                          LET R0 := #DSBUF1-1
16049  055530  012700  062367                                                         MOV     #DSBUF1-1,R0
16050  055534                          LET R1 := #207
16051  055534  012701  000207                                                         MOV     #207,R1
16052  055540                          REPEAT
16053  055540                                                                  $52334:
16054  055540                              LET (R0)+ :B= #0
16055  055540  105020                                                                 CLRB    (R0)+
16056  055542                              LET R1 := R1 - #1
16057  055542  005301                                                                 DEC     R1
16058  055544                          UNTIL R1 EQ #0
16059  055544  005701                                                                 TST     R1
16060  055546  001374                                                                 BNE     $52334
16061  055550                          LET R0 := SAVR0
16062  055550  013700  000576                                                         MOV     SAVR0,R0
16063  055554                          LET R1 := SAVR1
16064  055554  013701  000600                                                         MOV     SAVR1,R1
16065  055560                          ENDRTN
16066  055560                                                                  $52332:
16067  055560                                                                  $52333:
16068  055560  000207                                                                 RTS     PC
16069
16070
16071
16072                                  ;;**********************************************************************
16073                                  .SBTTL  SAVE REGISTERS R0 - R5
16074                                  ;;**********************************************************************
16075                                  ;*THIS ROUTINE SAVES R0 THROUGH R5 IN LOCATIONS SAVR0 - SAVR5.
16076                                  ;*
16077
16078  055562                          ROUTINE SAVREG
16079  055562                                                                  SAVREG:
16080  055562                          LET SAVR0 := R0
16081  055562  010037  000576                                                         MOV     R0,SAVR0
16082  055566                          LET SAVR1 := R1
```

```
16083  055566  010137  000600                  MOV     R1,SAVR1
16084  055572
16085  055572  010237  000602                  MOV     R2,SAVR2
16086  055576
16087  055576  010337  000604                  MOV     R3,SAVR3
16088  055602
16089  055602  010437  000606                  MOV     R4,SAVR4
16090  055606
16091  055606  010537  000610                  MOV     R5,SAVR5
16092  055612
16093  055612                          $52335:
16094  055612                          $52336:
16095  055612  000207                  RTS     PC
16096
16097
16098
16099                   ;;*******************************************************************
16100                   .SBTTL  RESTORE REGISTERS R0 - R5
16101                   ;;*******************************************************************
16102                   ;*THIS ROUTINE RESTORES R0 THROUGH R5 FROM LOCATIONS SAVR0 - SAVR5
16103                   ;*
16104
16105  055614           ROUTINE RESREG
16106  055614                          RESREG:
16107  055614           LET R0 := SAVR0
16108  055614  013700  000576                  MOV     SAVR0,R0
16109  055620           LET R1 := SAVR1
16110  055620  013701  000600                  MOV     SAVR1,R1
16111  055624           LET R2 := SAVR2
16112  055624  013702  000602                  MOV     SAVR2,R2
16113  055630           LET R3 := SAVR3
16114  055630  013703  000604                  MOV     SAVR3,R3
16115  055634           LET R4 := SAVR4
16116  055634  013704  000606                  MOV     SAVR4,R4
16117  055640           LET R5 := SAVR5
16118  055640  013705  000610                  MOV     SAVR5,R5
16119  055644           ENDRTN
16120  055644
16121  055644                          $52337:
16122  055644  000207                  $52340: RTS     PC
16123
```

```
16124
16125                                   ;*****************************************
16126                                   .SBTTL  PACK - PACK DECIMAL STRING ROUTINE
16127                                   ;*****************************************
16128
16129                                   ;+
16130                                   ;  FUNCTIONAL DESCRIPTION
16131                                   ;
16132                                   ;       THE PACK ROUTINE ACCEPTS UNPACKED DATA FROM A TEST CASE
16133                                   ;       TABLE AND PACKS IT (TWO BCD CHARS/BYTE) INTO ONE OF THE
16134                                   ;       DECIMAL STRING BUFFERS.
16135                                   ;
16136                                   ;  INPUTS:
16137                                   ;       1. ADDRESS OF THE DESTINATION BUFFER. ** NOTE: ** THIS MUST
16138                                   ;          BE #DSBUF1, #DSBUF2, OR #DS.EXP.
16139                                   ;       2. POINTER TO SOURCE DATA IN TEST CASE TABLE. ** NOTE: **
16140                                   ;          THIS MUST BE DATA01, DATA03, OR DATA05.
16141                                   ;       3. POINTER TO DESTINATION STRING LENGTH. ** NOTE: ** THIS
16142                                   ;          MUST BE DATA00, DATA02, OR DATA04.
16143                                   ;
16144                                   ;  OUTPUTS:
16145                                   ;       NONE
16146                                   ;
16147                                   ;  PATHOLOGICAL CONNECTIONS:
16148                                   ;       NONE.
16149                                   ;
16150                                   ;  SUBORDINATE ROUTINES:
16151                                   ;       NONE.
16152                                   ;
16153                                   ;  FUNCTIONAL SIDE-EFFECTS:
16154                                   ;       NONE.
16155                                   ;
16156                                   ;  CALLING SEQUENCE:
16157                                   ;
16158                                   ;       CALL PACK IN <DSTADR,SRCADR,LENGTH>. FOR INPUT PARAMETERS
16159                                   ;       REFER TO ABOVE INPUTS:.
16160                                   ;
16161                                   ;  NOTE:
16162                                   ;       R3 IS USED AS A BYTE ASSEMBLY AREA.
16163                                   ;       R4 IS USED TO HOLD THE SIGN OF THE STRING (+ = #14,-   #15).
16164                                   ;-
16165
16166  055646                           ROUTINE PACK <DSTADR,SRCADR,LENGTH>
16167  055646                                                                          PACK:
16168  055646
16169  055646  016500  000000            LET R0 := DSTADR(R5)                                 MOV     DSTADR(R5),R0
16170  055652
16171  055652  016501  000002            LET R1 := SRCADR(R5)                                 MOV     SRCADR(R5),R1
16172  055656
16173  055656  016502  000004            LET R2 := LENGTH(R5) CLR.BY #70000                   MOV     LENGTH(R5),R2
16174  055662  042702  070000                                                                 BIC     #70000,R2
16175
16176                                     ;+
16177                                     ;       STORE SIGN OF STRING IN R4
16178                                     ;-
16179
```

```
16180  055666                          IF (R1)+ EQ #0 THEN             ;SIGN IS +
16181  055666  005721                                                                  TST     (R1)+
16182  055670  001003                                                                  BNE     $52343
16183  055672                            LET R4 := #14
16184  055672  012704  000014                                                         MOV     #14,R4
16185  055676                          ELSE                            ;SIGN IS -
16186  055676  000402                                                                  BR      $52344
16187  055700                                                                 $52343:
16188  055700                            LET R4 := #15
16189  055700  012704  000015                                                         MOV     #15,R4
16190  055704                          ENDIF
16191  055704                                                                 $52344:
16192
16193                                   ;+
16194                                   ;       IF LENGTH IS ZERO, THEN SIGN STRING AND EXIT; ELSE IF
16195                                   ;       STRING LENGTH IS EVEN, STORE THE MSD (STRING LENGTH IS
16196                                   ;       NOW ODD).NOW STORE ALL BUT THE LAST DIGIT. BUILD LSD
16197                                   ;       & SIGN AND EXIT.
16198                                   ;-
16199
16200  055704                          IF R2 EQ #0 THEN                ;STRING LENGTH = 0
16201  055704  005702                                                                  TST     R2
16202  055706  001002                                                                  BNE     $52345
16203  055710                            LET (R0) :B= R4               ;SIGN THE BUFFER AND EXIT
16204  055710  110410                                                                  MOVB    R4,(R0)
16205  055712                          ELSE
16206  055712  000425                                                                  BR      $52346
16207  055714                                                                 $52345:
16208  055714                            IF #BIT00 NOTSETIN R2 THEN    ;LENGTH IS EVEN & > 0
16209  055714  032702  000001                                                         BIT     #BIT00,R2
16210  055720  001002                                                                  BNE     $52347
16211  055722                              LET (R0)+ :B= (R1)+         ;MOVE THE EVEN NIBBLE
16212  055722  112120                                                                 MOVB    (R1)+,(R0)+
16213  055724                              LET R2 := R2 - #1           ;DEC NIBBLE COUNTER
16214  055724  005302                                                                 DEC     R2
16215  055726                            ENDIF
16216  055726                                                                 $52347:
16217  055726                            WHILE R2 NE #1 DO
16218  055726                                                                 $52350:
16219  055726  020227  000001                                                         CMP     R2,#1
16220  055732  001410                                                                 BEQ     $52351
16221  055734                              LET R3 :B= (R1)+            ;GET A BCD
16222  055734  112103                                                                 MOVB    (R1)+,R3
16223  055736                              INLINE <ASH #4,   R3>       ;SHIFT IT TO THE HIGH NIBBLE
16224  055736  072327  000004                                                         ASH #4, R3
16225  055742                              LET R3 :B= R3 SET.BY (R1)+          ;PACK IN LOW NIBBLE
16226  055742  152103                                                                 BISB    (R1)+,R3
16227  055744                              LET (R0)+ :B= R3            ;STORE RESULT
16228  055744  110320                                                                 MOVB    R3,(R0)+
16229  055746                              LET R2 := R2 - #2           ;DEC NIBBLE COUNTER
16230  055746  162702  000002                                                         SUB     #2,R2
16231  055752                            ENDDO
16232  055752  000765                                                                 BR      $52350
16233  055754                                                                 $52351:
16234  055754                            LET R3 :B= (R1)               ;GET LAST BCD
16235  055754  111103                                                                 MOVB    (R1),R3
```

```
16236  055756
16237  055756  072327  000004          INLINE <ASH #4,     R3>     ;SHIFT IT TO THE HIGH NIBBLE
                                                                                    ASH #4, R3
16238  055762
16239  055762  150403                  LET R3 :B= R3 SET.BY R4     ;ADD SIGN
                                                                                    BISB    R4,R3
16240  055764
16241  055764  110310                  LET (R0) :B= R3             ;STORE LSD & SIGN
                                                                                    MOVB    R3,(R0)
16242  055766                        ENDIF
16243  055766                                                                $52346:
16244  055766                        ENDRTN
16245  055766                                                                $52341:
16246  055766                                                                $52342:
16247  055766  000207                                                              RTS     PC
16248
```

```
16249                                   ;;*****************************************************************
16250                                   .SBTTL  SCOPE HANDLER ROUTINE
16251                                   ;;*****************************************************************
16252                                   ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
16253                                   ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
16254                                   ;*AND LOAD THE ERROR FLAG (ERRFLG) INTO DISPLAY<15:08>
16255                                   ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
16256                                   ;*SW14=1         LOOP ON TEST
16257                                   ;*SW11=1         INHIBIT ITERATIONS
16258                                   ;*
16259                                   ;*CALL
16260                                   ;*      SCOPE           ;;SCOPE=IOT
16261
16262  055770                           $SCOPE:
16263  055770  104406                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
16264  055772  032777  040000  122426          BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
16265  056000  001034                          BNE     $OVER           ;;YES IF SW14=1
16266  056002  032777  004000  122416          BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
16267  056010  001011                          BNE     1$              ;;BRANCH IF YES
16268  056012  005737  000636                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
16269  056016  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
16270  056020  005237  000406                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
16271  056024  023737  000404  000406          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
16272  056032  002017                          BGE     $OVER           ;;BRANCH IF MORE ITERATION REQUIRED
16273  056034  012737  000001  000406  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
16274  056042  013737  056106  000404          MOV     $MXCNT,$TIMES           ;;SET NUMBER OF ITERATIONS TO DO
16275  056050  005237  000402          $SVLAD: INC     $TSTNM          ;;COUNT TEST NUMBERS
16276  056054  013737  000402  000634          MOV     $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
16277  056062  011637  000410                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
16278  056066  005037  000454                  CLR     ERRFLG          ;;ZERO THE ERROR FLAG
16279  056072  013777  000402  122330  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
16280  056100  013716  000410                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
16281  056104  000002                          RTI                     ;;FIXES PS
16282  056106  000100          $MXCNT: .WORD   100             ;;MAXIMUM NUMBER OF ITERATIONS
16283
16284
16285                                   ;;*****************************************************************
16286                                   .SBTTL  POWER DOWN AND UP ROUTINES
16287                                   ;;*****************************************************************
16288                                   ;POWER DOWN ROUTINE
16289  056110  012737  056260  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
16290  056116  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
16291  056124  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
16292  056126  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
16293  056130  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
16294  056132  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
16295  056134  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
16296  056136  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
16297  056140  017746  122262                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
16298  056144  010637  056264                  MOV     SP,$SAVR6       ;;SAVE SP
16299  056150  012737  056162  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
16300  056156  000000                          HALT
16301  056160  000776                          BR      .-2             ;;HANG UP
16302
16303                                   ;;*****************************************************************
16304                                   ;POWER UP ROUTINE
```

```
16305  056162  012737  056260  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
16306  056170  013706  056264                  MOV     $SAVR6,SP        ;;GET SP
16307  056174  005037  056264                  CLR     $SAVR6           ;;WAIT LOOP FOR THE TTY
16308  056200  005237  056264          1$:     INC     $SAVR6           ;;WAIT FOR THE INC
16309  056204  001375                          BNE     1$               ;;OF  WORD
16310  056206  012677  122214                  MOV     (SP)+,@SWR       ;;POP STACK INTO @SWR
16311  056212  012605                          MOV     (SP)+,R5         ;;POP STACK INTO R5
16312  056214  012604                          MOV     (SP)+,R4         ;;POP STACK INTO R4
16313  056216  012603                          MOV     (SP)+,R3         ;;POP STACK INTO R3
16314  056220  012602                          MOV     (SP)+,R2         ;;POP STACK INTO R2
16315  056222  012601                          MOV     (SP)+,R1         ;;POP STACK INTO R1
16316  056224  012600                          MOV     (SP)+,R0         ;;POP STACK INTO R0
16317  056226  012737  056110  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
16318  056234  012737  000340  000026          MOV     #340,@#PWRVEC+2  ;;PRIO:7
16319  056242  012737  060630  000546          MOV     #PWRMSG,MSGADR
16320  056250  104401                          TYPE                     ;;REPORT THE POWER FAILURE
16321  056252  012716                          MOV     (PC)+,(SP)       ;;RESTART AT PHALT
16322  056254  056266          $PWRAD: .WORD   PHALT            ;;RESTART ADDRESS
16323  056256  000002                  RTI
16324  056260  000000          $ILLUP: HALT                     ;;THE POWER UP SEQUENCE WAS STARTED
16325  056262  000776                  BR      .-2              ;; BEFORE THE POWER DOWN WAS COMPLETE
16326  056264  000000          $SAVR6: 0                        ;;PUT THE SP HERE
16327
16328  056266  000000          PHALT:  HALT                             ;HALT HERE AFTER A POWER FAIL
16329  056270  000137  001200          JMP     @#START                  ;RESTART THE TEST AT THE BEGINNING
16330
16331                          ;;*****************************************************************
16332                          .SBTTL  ERROR HANDLER ROUTINE
16333                          ;;*****************************************************************
16334                          ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
16335                          ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
16336                          ;*AND GO TO $ERRTYP ON ERROR
16337                          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
16338                          ;*SW15=1         HALT ON ERROR
16339                          ;*SW13=1         INHIBIT ERROR TYPEOUTS
16340
16341  056274                  ERROR:
16342  056274  104406                  CKSWR                    ;;TEST FOR CHANGE IN SOFT-SWR
16343  056276  005237  000454  7$:     INC     ERRFLG           ;;SET THE ERROR FLAG
16344  056302  001775                  BEQ     7$               ;;DON'T LET THE FLAG GO TO ZERO
16345  056304  013777  000402  122116  MOV     $TSTNM,@DISPLAY  ;;DISPLAY TEST NUMBER AND ERROR FLAG
16346  056312  005237  000414  1$:     INC     $ERTTL           ;;COUNT THE NUMBER OF ERRORS
16347  056316  011637  000420          MOV     (SP),$ERRPC      ;;GET ADDRESS OF ERROR INSTRUCTION
16348  056322  162737  000004  000420  SUB     #4,$ERRPC
16349  056330  032777  020000  122070  BIT     #BIT13,@SWR      ;;SKIP TYPEOUT IF SET
16350  056336  001006                  BNE     20$              ;;SKIP TYPEOUTS
16351  056340  004737  056430          JSR     PC,$ERRTYP       ;;GO TO USER ERROR ROUTINE
16352  056344  012737  000443  000546  MOV     #$CRLF,MSGADR
16353  056352  104401                  TYPE
16354  056354                  20$:
16355  056354  122737  000001  000650  CMPB    #APTENV,$ENV     ;;RUNNING IN APT MODE
16356  056362  001007                  BNE     2$               ;;NO,SKIP APT ERROR REPORT
16357  056364  113737  000550  056376  MOVB    ERR,21$          ;;SET ITEM NUMBER AS ERROR NUMBER
16358  056372  004737  060150          JSR     PC,$ATY4         ;;REPORT FATAL ERROR TO APT
16359  056376     000          21$:    .BYTE   0
16360  056377     000                  .BYTE   0
```

```
16361  056400  000777                  22$:    BR      22$             ;;APT ERROR LOOP
16362  056402  005777  122020          2$:     TST     @SWR            ;;HALT ON ERROR
16363  056406  100002                          BPL     3$              ;;SKIP IF CONTINUE
16364  056410  000000                          HALT                    ;;HALT ON ERROR!
16365  056412  104406                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
16366  056414                          3$:
16367  056414  022737  055214  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
16368  056422  001001                          BNE     6$              ;;BRANCH IF NO
16369  056424  000000                          HALT                    ;;YES
16370  056426                          6$:
16371  056426  000207                          RTS     PC              ;;RETURN
16372
16373                                  ;;*******************************************************************
16374                                  .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
16375                                  ;;*******************************************************************
16376                                  ;*THIS ROUTINE USES THE 'ERROR TYPE NUMBER'' (ERR) TO DETERMINE WHICH
16377                                  ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE 'ERROR TABLE'' ($ERRTB),
16378                                  ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
16379
16380  056430                          $ERRTYP:
16381  056430  012737  061000  000546          MOV     #ERRHDR,MSGADR          ;TYPE ERROR HEADER
16382  056436  104401                          TYPE
16383  056440  013737  000550  000472          MOV     ERR,ERRTMP              ;TYPE APPROPRIATE ERROR MESSAGE
16384  056446  005337  000472                  DEC     ERRTMP
16385  056452  006337  000472                  ASL     ERRTMP
16386  056456  062737  056562  000472          ADD     #ERRTBL,ERRTMP
16387  056464  017737  122002  000546          MOV     @ERRTMP,MSGADR
16388  056472  104401                          TYPE
16389  056474  012737  060660  000546          MOV     #SPACE1,MSGADR          ;TYPE ONE SPACE
16390  056502  104401                          TYPE
16391  056504  013746  000420                  MOV     $ERRPC,-(SP)            ;TYPE THE ERROR PC
16392  056510  104402                          TYPOC
16393  056512  013737  000544  000472          MOV     CTL,ERRTMP              ;TYPE FAILING CONTROL CHIP NUMBER
16394  056520  162737  000004  000472          SUB     #4,ERRTMP
16395  056526  006337  000472                  ASL     ERRTMP
16396  056532  062737  056570  000472          ADD     #CTLTBL,ERRTMP
16397  056540  017737  121726  000546          MOV     @ERRTMP,MSGADR
16398  056546  104401                          TYPE
16399  056550  012737  000443  000546          MOV     #$CRLF,MSGADR           ;TYPE CARRIAGE-RETURN/LINE-FEED
16400  056556  104401                          TYPE
16401  056560  000207                          RTS     PC
16402
16403  056562  061041                  ERRTBL: .WORD   ERR1                    ;ADDRESSES OF ERROR MESSAGES
16404  056564  061072                          .WORD   ERR2
16405  056566  061121                          .WORD   ERR3
16406
16407  056570  060662                  CTLTBL: .WORD   CTL4                    ;ADDRESSES OF CHIP NUMBER MESSAGES
16408  056572  060677                          .WORD   CTL5
16409  056574  060714                          .WORD   CTL6
16410  056576  060731                          .WORD   CTL7
16411  056600  060746                          .WORD   CTL8
16412  056602  060763                          .WORD   CTL9
16413
16414
16415                                  ;;*******************************************************************
16416                                  .SBTTL  TYPE ROUTINE
```

```
16417                                ;;*****************************************************************
16418                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
16419                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
16420                                ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
16421                                ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
16422                                ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
16423                                ;*
16424
16425  056604  105737  000435       $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
16426  056610  100002                       BPL     1$              ;;BR IF YES
16427  056612  000000                       HALT                    ;;HALT HERE IF NO TERMINAL
16428  056614  000425                       BR      3$              ;;LEAVE
16429  056616  010046                1$:    MOV     R0,-(SP)        ;;SAVE R0
16430  056620  013700  000546               MOV     MSGADR,R0       ;;GET ADDRESS OF ASCIZ STRING
16431  056624  122737  000001  00065C       CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
16432  056632  001006                       BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
16433  056634  132737  000100  000651       BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
16434  056642  001402                       BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
16435  056644  004737  060140               JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
16436  056650  132737  000040  000651 62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
16437  056656  001003                       BNE     60$             ;;YES,SKIP TYPE OUT
16438  056660  112046                2$:    MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
16439  056662  001003                       BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
16440  056664  005726                       TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
16441  056666  012600                60$:    MOV     (SP)+,R0        ;;RESTORE R0
16442  056670  000002                3$:     RTI                     ;;RETURN
16443  056672  122716  000011       4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
16444  056676  001432                       BEQ     8$
16445  056700  122716  000200               CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
16446  056704  001010                       BNE     5$
16447  056706  005726                       TST     (SP)+           ;;POP  <CR><LF> EQUIV
16448  056710  012737  000443  000546       MOV     #$CRLF,MSGADR
16449  056716  104401                       TYPE                    ;;TYPE A CR AND LF
16450  056720  105037  057054               CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
16451  056724  000755                       BR      2$              ;;GET NEXT CHARACTER
16452  056726  004737  057010        5$:    JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
16453  056732  123726  000434        6$:    CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
16454  056736  001350                       BNE     2$              ;;IF NO GO GET NEXT CHAR.
16455  056740  013746  000432               MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
16456                                                               ;;AND THE NULL CHAR.
16457  056744  105366  000001        7$:    DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
16458  056750  002770                       BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
16459  056752  004737  057010               JSR     PC,$TYPEC       ;;GO TYPE A NULL
16460  056756  105337  057054               DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
16461  056762  000770                       BR      7$              ;;LOOP
16462
16463                                ;HORIZONTAL TAB PROCESSOR
16464
16465  056764  112716  000040        8$:    MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
16466  056770  004737  057010        9$:    JSR     PC,$TYPEC       ;;TYPE A SPACE
16467  056774  132737  000007  057054       BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
16468  057002  001372                       BNE     9$              ;;TAB STOP
16469  057004  005726                       TST     (SP)+           ;;POP SPACE OFF STACK
16470  057006  000724                       BR      2$              ;;GET NEXT CHARACTER
16471  057010  105737  177564        $TYPEC: TSTB    @#TPS           ;;WAIT UNTIL PRINTER IS READY
16472  057014  100375                       BPL     $TYPEC
```

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16473  057016  116637  000002  177566          MOVB    2(SP),@#TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
16474  057024  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
16475  057032  001003                          BNE     1$              ;;BRANCH IF NO
16476  057034  105037  057054                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
16477  057040  000406                          BR      $TYPEX          ;;EXIT
16478  057042  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
16479  057050  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
16480  057052  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
16481  057054  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
16482  057056  000207                  $TYPEX: RTS     PC
16483
16484                                  ;;*****************************************************************
16485                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
16486                                  ;;*****************************************************************
16487                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
16488                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
16489                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
16490                                  ;*CALL:
16491                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
16492                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
16493                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
16494                                  ;*      .BYTE   M               ;;M=1 OR 0
16495                                  ;*                                      ;;1=TYPE LEADING ZEROS
16496                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
16497                                  ;*
16498                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
16499                                  ;*$TYPOS OR $TYPOC
16500                                  ;*CALL:
16501                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
16502                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
16503                                  ;*
16504                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
16505                                  ;*CALL:
16506                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
16507                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
16508
16509  057060  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
16510  057064  116637  000001  057307          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
16511  057072  112637  057311                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
16512  057076  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
16513  057102  000406                          BR      $TYPON
16514  057104  112737  000001  057307  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
16515  057112  112737  000006  057311          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
16516  057120  112737  000005  057306  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
16517  057126  010346                          MOV     R3,-(SP)        ;;SAVE R3
16518  057130  010446                          MOV     R4,-(SP)        ;;SAVE R4
16519  057132  010546                          MOV     R5,-(SP)        ;;SAVE R5
16520  057134  113704  057311                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
16521  057140  005404                          NEG     R4
16522  057142  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
16523  057146  110437  057310                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
16524  057152  113704  057307                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
16525  057156  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
16526  057162  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
16527  057164  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
16528  057166  000404                          BR      3$              ;;GO DO MSB
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16529  057170  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
16530  057172  006105                          ROL     R5
16531  057174  006105                          ROL     R5
16532  057176  010503                          MOV     R5,R3
16533  057200  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
16534  057202  105337  057310                  DECB    $OMODE          ;;TYPE THIS DIGIT?
16535  057206  100020                          BPL     7$              ;;BR IF NO
16536  057210  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
16537  057214  001002                          BNE     4$              ;;TEST FOR 0
16538  057216  005704                          TST     R4              ;;SUPPRESS THIS 0?
16539  057220  001403                          BEQ     5$              ;;BR IF YES
16540  057222  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
16541  057224  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
16542  057230  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
16543  057234  110337  057304                  MOVB    R3,8$           ;;SAVE FOR TYPING
16544  057240  012737  057304  000546          MOV     #8$,MSGADR
16545  057246  104401                          TYPE                    ;;GO TYPE THIS DIGIT
16546  057250  105337  057306          7$:     DECB    $OCNT           ;;COUNT BY 1
16547  057254  003345                          BGT     2$              ;;BR IF MORE TO DO
16548  057256  002402                          BLT     6$              ;;BR IF DONE
16549  057260  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
16550  057262  000742                          BR      2$              ;;GO DO THE LAST DIGIT
16551  057264  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
16552  057266  012604                          MOV     (SP)+,R4        ;;RESTORE R4
16553  057270  012603                          MOV     (SP)+,R3        ;;RESTORE R3
16554  057272  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
16555  057300  012616                          MOV     (SP)+,(SP)
16556  057302  000002                          RTI                     ;;RETURN
16557  057304     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
16558  057305     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
16559  057306     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
16560  057307     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
16561  057310  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
16562
16563
16564                                  ;;*****************************************************************
16565                                  .SBTTL  TTY INPUT ROUTINE
16566                                  ;;*****************************************************************
16567                                  .ENABL  LSB
16568
16569                                  ;;*****************************************************************
16570                                  ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
16571                                  ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
16572                                  ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
16573                                  ;*WHEN OPERATING IN TTY FLAG MODE.
16574  057312  022737  000176  000426  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
16575  057320  001106                          BNE     15$             ;;BRANCH IF NO
16576  057322  105737  177560                  TSTB    @#TKS           ;;CHAR THERE?
16577  057326  100103                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
16578  057330  113746  177562                  MOVB    @#TKB,-(SP)     ;;SAVE THE CHAR
16579  057334  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
16580  057340  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
16581  057344  001074                          BNE     15$             ;;NO, RETURN TO USER
16582  057346  123727  000422  000001          CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
16583  057354  001470                          BEQ     15$             ;;BRANCH IF YES
16584
```

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16585  057356  012737  060103  000546          MOV     #$CNTLG,MSGADR
16586  057364  104401                          TYPE                    ;;ECHO THE CONTROL-G (^G)
16587  057366  012737  060110  000546  $GTSWR: MOV     #$MSWR,MSGADR
16588  057374  104401                          TYPE                    ;;TYPE CURRENT CONTENTS
16589  057376  013746  000176                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
16590  057402  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
16591  057404  012737  060121  000546          MOV     #$MNEW,MSGADR
16592  057412  104401                          TYPE                    ;;PROMPT FOR NEW SWR
16593  057414  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
16594  057416  005046                          CLR     -(SP)           ;;THE NEW SWR
16595  057420  105737  177560          7$:     TSTB    @#TKS           ;;CHAR THERE?
16596  057424  100375                          BPL     7$              ;;IF NOT TRY AGAIN
16597
16598  057426  113746  177562                  MOVB    @#TKB,-(SP)     ;;PICK UP CHAR
16599  057432  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
16600
16601
16602
16603  057436  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
16604  057442  001007                          BNE     10$             ;;BRANCH IF NOT
16605  057444  012737  060076  000546          MOV     #$CNTLU,MSGADR
16606  057452  104401                          TYPE                    ;;YES, ECHO CONTROL-U (^U)
16607  057454  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
16608  057460  000755                          BR      19$             ;;LET'S TRY IT AGAIN
16609
16610
16611  057462  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
16612  057466  001024                          BNE     16$             ;;BRANCH IF NO
16613  057470  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
16614  057474  001403                          BEQ     11$             ;;BRANCH IF YES
16615  057476  016677  000002  120722          MOV     2(SP),@SWR      ;;SAVE NEW SWR
16616  057504  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
16617  057510  012737  000443  000546  14$:    MOV     #$CRLF,MSGADR
16618  057516  104401                          TYPE                    ;;ECHO <CR> AND <LF>
16619  057520  123727  000423  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
16620  057526  001003                          BNE     15$             ;;BRANCH IF NOT
16621  057530  012737  000100  177560          MOV     #100,@#TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
16622  057536  000002                  15$:    RTI                     ;;RETURN
16623  057540  004737  057010          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
16624  057544  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
16625  057550  002420                          BLT     18$             ;;BRANCH IF YES
16626  057552  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
16627  057556  003015                          BGT     18$             ;;BRANCH IF YES
16628  057560  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
16629  057564  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
16630  057570  001403                          BEQ     17$             ;;BRANCH IF YES
16631  057572  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
16632  057574  006316                          ASL     (SP)            ;;   CHAR OVER TO MAKE
16633  057576  006316                          ASL     (SP)            ;;   ROOM FOR NEW ONE.
16634  057600  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
16635  057604  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
16636  057610  000703                          BR      7$              ;;GET THE NEXT ONE
16637  057612  012737  000442  000546  18$:    MOV     #$QUES,MSGADR
16638  057620  104401                          TYPE                    ;;TYPE ?<CR><LF>
16639  057622  000714                          BR      20$             ;;SIMULATE CONTROL-U
16640                                  .DSABL  LSB
```

```
16641
16642
16643                                   ;;**********************************************************************
16644                                   ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
16645                                   ;*CALL:
16646                                   ;*      RDCHR                       ;;INPUT A SINGLE CHARACTER FROM THE TTY
16647                                   ;*      RETURN HERE                 ;;CHARACTER IS ON THE STACK
16648                                   ;*                                  ;;WITH PARITY BIT STRIPPED OFF
16649                                   ;
16650
16651  057624  011646                   $RDCHR: MOV     (SP),-(SP)          ;;PUSH DOWN THE PC
16652  057626  016666  000004  000002           MOV     4(SP),2(SP)         ;;SAVE THE PS
16653  057634  105737  177560          1$:     TSTB    @#TKS               ;;WAIT FOR
16654  057640  100375                          BPL     1$                  ;;A CHARACTER
16655  057642  113766  177562  000004          MOVB    @#TKB,4(SP)         ;;READ THE TTY
16656  057650  042766  177600  000004          BIC     #^C<177>,4(SP)      ;;GET RID OF JUNK IF ANY
16657  057656  026627  000004  000023          CMP     4(SP),#23           ;;IS IT A CONTROL-S?
16658  057664  001013                          BNE     3$                  ;;BRANCH IF NO
16659  057666  105737  177560          2$:     TSTB    @#TKS               ;;WAIT FOR A CHARACTER
16660  057672  100375                          BPL     2$                  ;;LOOP UNTIL ITS THERE
16661  057674  113746  177562                  MOVB    @#TKB,-(SP)         ;;GET CHARACTER
16662  057700  042716  177600                  BIC     #^C177,(SP)         ;;MAKE IT 7-BIT ASCII
16663  057704  022627  000021                  CMP     (SP)+,#21           ;;IS IT A CONTROL-Q?
16664  057710  001366                          BNE     2$                  ;;IF NOT DISCARD IT
16665  057712  000750                          BR      1$                  ;;YES, RESUME
16666  057714  026627  000004  000140  3$:     CMP     4(SP),#140          ;;IS IT UPPER CASE?
16667  057722  002407                          BLT     4$                  ;;BRANCH IF YES
16668  057724  026627  000004  000175          CMP     4(SP),#175          ;;IS IT A SPECIAL CHAR?
16669  057732  003003                          BGT     4$                  ;;BRANCH IF YES
16670  057734  042766  000040  000004          BIC     #40,4(SP)           ;;MAKE IT UPPER CASE
16671  057742  000002                  4$:     RTI                         ;;GO BACK TO USER
16672                                   ;;**********************************************************************
16673                                   ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
16674                                   ;*CALL:
16675                                   ;*      RDLIN                       ;;INPUT A STRING FROM THE TTY
16676                                   ;*      RETURN HERE                 ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
16677                                   ;*                                  ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
16678
16679  057744  010346                   $RDLIN: MOV     R3,-(SP)            ;;SAVE R3
16680  057746  012703  060066          1$:     MOV     #$TTYIN,R3          ;;GET ADDRESS
16681  057752  022703  060076          2$:     CMP     #$TTYIN+8.,R3       ;;BUFFER FULL?
16682  057756  101405                          BLOS    4$                  ;;BR IF YES
16683  057760  100407                          RDCHR                       ;;GO READ ONE CHARACTER FROM THE TTY
16684  057762  112613                          MOVB    (SP)+,(R3)          ;;GET CHARACTER
16685  057764  122713  000177          10$:    CMPB    #177,(R3)           ;;IS IT A RUBOUT
16686  057770  001005                          BNE     3$                  ;;SKIP IF NOT
16687  057772  013737  000442  000546  4$:     MOV     $QUES,MSGADR
16688  060000  104401                          TYPE                        ;;TYPE A '?'
16689  060002  000761                          BR      1$                  ;;CLEAR THE BUFFER AND LOOP
16690  060004  111337  060064          3$:     MOVB    (R3),9$             ;;ECHO THE CHARACTER
16691  060010  012737  060064  000546          MOV     #9$,MSGADR
16692  060016  104401                          TYPE
16693  060020  122723  000015                  CMPB    #15,(R3)+           ;;CHECK FOR RETURN
16694  060024  001352                          BNE     2$                  ;;LOOP IF NOT RETURN
16695  060026  105063  177777                  CLRB    -1(R3)              ;;CLEAR RETURN (THE 15)
16696  060032  012737  000444  000546          MOV     #$LF,MSGADR
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16697  060040  104401                          TYPE                    ;;TYPE A LINE FEED
16698  060042  012603                          MOV     (SP)+,R3        ;;RESTORE R3
16699  060044  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
16700  060046  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
16701  060054  012766  060066  000004          MOV     #$TTYIN,4(SP)
16702  060062  000002                          RTI                     ;;RETURN
16703  060064     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
16704  060065     000                          .BYTE   0               ;;TERMINATOR
16705  060066  000010               $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
16706  060076  052536  005015     000 $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL 'U'
16707  060103     136  006507  000012 $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL 'G'
16708  060110  005015  053523  020122 $MSWR:  .ASCIZ  <15><12>/SWR = /
16709  060116  020075     000
16710  060121     040  047040  053505 $MNEW:  .ASCIZ  /  NEW = /
16711  060126  036440  000040
16712
16713
16714                                  ;;*****************************************************************
16715                                  .SBTTL  APT COMMUNICATIONS ROUTINE
16716                                  ;;*****************************************************************
16717  060132  112737  000001  060354 $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
16718  060140  112737  000001  060352 $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
16719  060146  000403                          BR      $ATYC
16720  060150  112737  000001  060354 $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
16721  060156                          $ATYC:
16722  060156  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
16723  060160  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
16724  060162  105737  060352                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
16725  060166  001437                          BEQ     10$             ;;IF NOT:  BR
16726  060170  122737  000001  000650          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
16727  060176  001031                          BNE     3$              ;;IF NOT:  BR
16728  060200  132737  000100  000651          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
16729  060206  001425                          BEQ     3$              ;;IF NOT:  BR
16730  060210  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
16731  060214  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
16732  060222  005737  000630          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
16733  060226  001375                          BNE     1$              ;;IF NOT:  WAIT
16734  060230  010037  000644                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
16735  060234  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
16736  060236  001376                          BNE     2$
16737  060240  163700  000644                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
16738  060244  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
16739  060246  010037  000646                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
16740  060252  012737  000004  000630          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
16741  060260  000402                          BR      10$
16742  060262  004737  056604          3$:     JSR     PC,$TYPE        ;;CALL TYPE MACRO
16743  060266  105737  060354          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
16744  060272  001416                          BEQ     12$             ;;IF NOT:  BR
16745  060274  005737  000650                  TST     $ENV            ;;RUNNING UNDER APT?
16746  060300  001413                          BEQ     12$             ;;IF NOT:  BR
16747  060302  005737  000630          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
16748  060306  001375                          BNE     11$             ;;IF NOT:  WAIT
16749  060310  017637  000004  000632          MOV     @4(SP),$FATAL   ;;GET ERROR #
16750  060316  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
16751  060324  005237  000630                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
16752  060330  105037  060354          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
```

```
16753  060334  105037  060353              CLRB    $LFLG           ;;CLEAR LOG FLAG
16754  060340  105037  060352              CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
16755  060344  012601                      MOV     (SP)+,R1        ;;POP STACK INTO R1
16756  060346  012600                      MOV     (SP)+,R0        ;;POP STACK INTO R0
16757  060350  000207                      RTS     PC              ;;RETURN
16758  060352     000          $MFLG:   .BYTE   0               ;;MESSG. FLAG
16759  060353     000          $LFLG:   .BYTE   0               ;;LOG FLAG
16760  060354     000          $FFLG:   .BYTE   0               ;;FATAL FLAG
16761          060356                      .EVEN
16762          000200          APTSIZE=200
16763          000001          APTENV=001
16764          000100          APTSPOOL=100
16765          000040          APTCSUP=040
16766
16767
16768                          ;;*****************************************************************
16769                          .SBTTL  TRAP DECODER
16770                          ;;*****************************************************************
16771                          ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE 'TRAP' INSTRUCTION
16772                          ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
16773                          ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
16774                          ;*GO TO THAT ROUTINE.
16775
16776  060356  010046          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
16777  060360  016600  000002          MOV     2(SP),R0        ;;GET TRAP ADDRESS
16778  060364  005740                  TST     -(R0)           ;;BACKUP BY 2
16779  060366  111000                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
16780  060370  006300                  ASL     R0              ;;POSITION FOR INDEXING
16781  060372  016000  060412          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
16782  060376  000200                  RTS     R0              ;;GO TO ROUTINE
16783
16784
16785                          ;;THIS IS USE TO HANDLE THE ''GETPRI'' MACRO
16786
16787  060400  011646          $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
16788  060402  016666  000004  000002  MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
16789  060410  000002                  RTI                     ;;RESTORE THE PSW
16790
16791                          .SBTTL  TRAP TABLE
16792
16793                          ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
16794                          ;*BY THE ''TRAP'' INSTRUCTION.
16795
16796                          ;       ROUTINE
16797                          ;       -------
16798  060412  060400          $TRPAD: .WORD   $TRAP2
16799  060414  056604                  $TYPE   ;;CALL=TYPE      TRAP+1(104401)  TTY TYPEOUT ROUTINE
16800  060416  057104                  $TYPOC  ;;CALL=TYPOC     TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
16801  060420  057060                  $TYPOS  ;;CALL=TYPOS     TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
16802  060422  057120                  $TYPON  ;;CALL=TYPON     TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
16803  060424  057366                  $GTSWR  ;;CALL=GTSWR     TRAP+5(104405)  GET SOFT-SWR SETTING
16804  060426  057312                  $CKSWR  ;;CALL=CKSWR     TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
16805  060430  057624                  $RDCHR  ;;CALL=RDCHR     TRAP+07(104407) TTY TYPEIN CHARACTER ROUTINE
16806  060432  057744                  $RDLIN  ;;CALL=RDLIN     TRAP+10(104410) TTY TYPEIN STRING ROUTINE
16807
16808                          ;;*****************************************************************
```

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16809                                      .SBTTL  TELETYPE MESSAGES
16810                                      ;;*****************************************************************
16811  060434  043200  030461  041440  TITLE:  .ASCIZ  <200>/F11 CIS DIAGNOSTIC TEST/<200>
16812  060442  051511  042040  040511
16813  060450  047107  051517  044524
16814  060456  020103  042524  052123
16815  060464  000200
16816  060466  040600  020116  047125  TIMMSG: .ASCIZ  <200>/AN UNEXPECTED TIME-OUT TRAP OCCURRED/
16817  060474  054105  042520  052103
16818  060502  042105  052040  046511
16819  060510  026505  052517  020124
16820  060516  051124  050101  047440
16821  060524  041503  051125  042522
16822  060532  000104
16823  060534  040600  020116  047125  ILLMSG: .ASCIZ  <200>/AN UNEXPECTED ILLEGAL & RESERVED INSTRUCTION TRAP OCCURRED/
16824  060542  054105  042520  052103
16825  060550  042105  044440  046114
16826  060556  043505  046101  023040
16827  060564  051040  051505  051105
16828  060572  042526  020104  047111
16829  060600  052123  052522  052103
16830  060606  047511  020116  051124
16831  060614  050101  047440  041503
16832  060622  051125  042522  000104
16833  060630  050200  053517  051105  PWRMSG: .ASCIZ  <200>/POWER FAILURE OCCURRED/
16834  060636  043040  044501  052514
16835  060644  042522  047440  041503
16836  060652  051125  042522  000104
16837  060660  000040                   SPACE1: .ASCIZ  / /
16838  060662  020040  020040  020040  CTL4:   .ASCIZ  /      23-*04/
16839  060670  031462  025055  032060
16840  060676     000
16841  060677     040  020040  020040  CTL5:   .ASCIZ  /      23-*05/
16842  060704  031040  026463  030052
16843  060712  000065
16844  060714  020040  020040  020040  CTL6:   .ASCIZ  /      23-*06/
16845  060722  031462  025055  033060
16846  060730     000
16847  060731     040  020040  020040  CTL7:   .ASCIZ  /      23-*07/
16848  060736  031040  026463  030052
16849  060744  000067
16850  060746  020040  020040  020040  CTL8:   .ASCIZ  /      23-*08/
16851  060754  031462  025055  034060
16852  060762     000
16853  060763     040  020040  020040  CTL9:   .ASCIZ  /      23-*09/
16854  060770  031040  026463  030052
16855  060776  000071
16856
16857
16858                                      ;;*****************************************************************
16859                                      .SBTTL  TEST ERROR MESSAGES
16860                                      ;;*****************************************************************
16861  061000  100200  051105  047522  ERRHDR: .ASCIZ  <200><200>/ERROR PC    CTL CHIP #        /
16862  061006  020122  041520  020040
16863  061014  020040  052103  020114
16864  061022  044103  050111  021440
```

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16865  061030  020040  020040  020040
16866  061036  020040     000
16867  061041     103  051511  044440  ERR1:   .ASCIZ  /CIS INSTRUCTION FAILURE/<200>
16868  061046  051516  051124  041525
16869  061054  044524  047117  043040
16870  061062  044501  052514  042522
16871  061070  000200
16872  061072  044503  020123  047111  ERR2:   .ASCIZ  /CIS INTERRUPT FAILURE/<200>
16873  061100  042524  051122  050125
16874  061106  020124  040506  046111
16875  061114  051125  100105     000
16876  061121     116  020117  051124  ERR3:   .ASCIZ  /NO TRAP ON ILLEGAL CIS CLASS OPCODE/<200>
16877  061126  050101  047440  020116
16878  061134  046111  042514  040507
16879  061142  020114  044503  020123
16880  061150  046103  051501  020123
16881  061156  050117  047503  042504
16882  061164  000200
16883
16884
16885                          .EVEN
16886
16887
16888                          ;;*****************************************************************
16889                          .SBTTL  BUFFERS & TABLES
16890                          ;;*****************************************************************
16891                          ;
16892  061256  000100          BUFF1:  .BLKB   100         ;CHARACTER STRING BUFFER 1
16893  061266  000100          BUFF2:  .BLKB   100         ;CHARACTER STRING BUFFER 2
16894  061366  000400          TRANS:  .BLKB   400         ;TRANSLATION TABLE
16895  061766  000400          CHRSET: .BLKB   400         ;CHARACTER SET TABLE
16896
16897
16898          062367                  .ODD
16899  062367     000                  .BYTE   0               ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
16900  062370  000040          DSBUF1: .BLKB   40          ;DECIMAL STRING BUFFER 1
16901
16902          062431                  .ODD
16903  062431     000                  .BYTE   0               ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
16904  062432  000040          DSBUF2: .BLKB   40          ;DECIMAL STRING BUFFER 2
16905
16906          062473                  .ODD
16907  062473     000                  .BYTE   0               ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
16908  062474  000040          DS.DST: .BLKB   40          ;DESTINATION DECIMAL STRING BUFFER
16909
16910          062535                  .ODD
16911  062535     000                  .BYTE   0               ;RESERVED FOR SIGN FOR LEADING SEPARATE STRINGS
16912  062536  000040          DS.EXP: .BLKB   40          ;DECIMAL STRING BUFFER OF EXPECTED RESULTS
16913
16914
16915                          ;;*****************************************************************
16916                          .SBTTL  TEST CASES FOR CMPN AND CMPP
16917                          ;;*****************************************************************
16918                          ;
16919
16920  062576  000007          TCMP:   .WORD   7               ;# OF TEST CASES FOR CMPN & CMPP
```

```
16921
16922  062600  000000                  .WORD   0                       ;SRC1 LENGTH
16923  062602  062670                  .WORD   CMP1                    ;SRC1 POINTER
16924  062604  000000                  .WORD   0                       ;SRC2 LENGTH
16925  062606  062674                  .WORD   CMP1A                   ;SRC2 POINTER
16926
16927  062610  000007                  .WORD   7               ;TEST CASE NUMBER 2
16928  062612  062700                  .WORD   CMP2
16929  062614  000000                  .WORD   0
16930  062616  062712                  .WORD   CMP2A
16931
16932  062620  000000                  .WORD   0               ;TEST CASE NUMBER 3
16933  062622  062716                  .WORD   CMP3
16934  062624  000020                  .WORD   20
16935  062626  062722                  .WORD   CMP3A
16936
16937  062630  000011                  .WORD   11              ;TEST CASE NUMBER 4
16938  062632  062744                  .WORD   CMP4
16939  062634  000011                  .WORD   11
16940  062636  062760                  .WORD   CMP4A
16941
16942  062640  000006                  .WORD   6               ;TEST CASE NUMBER 5
16943  062642  062774                  .WORD   CMP5
16944  062644  000006                  .WORD   6
16945  062646  063004                  .WORD   CMP5A
16946
16947  062650  000001                  .WORD   1               ;TEST CASE NUMBER 6
16948  062652  063014                  .WORD   CMP6
16949  062654  000001                  .WORD   1
16950  062656  063020                  .WORD   CMP6A
16951
16952  062660  000006                  .WORD   6               ;TEST CASE NUMBER 7
16953  062662  063024                  .WORD   CMP7
16954  062664  000005                  .WORD   5
16955  062666  063034                  .WORD   CMP7A
16956
16957
16958  062670  000000          CMP1:   .WORD   0                               ;SRC1 SIGN
16959  062672     000                  .BYTE                                   ;DECIMAL STRING FOR SRC1
16960          062674                  .EVEN
16961  062674  000000          CMP1A:  .WORD   0                               ;SRC2 SIGN
16962  062676     000                  .BYTE                                   ;DECIMAL STRING FOR SRC2
16963          062700                  .EVEN
16964
16965  062700  000000          CMP2:   .WORD   0                               ;SRC1 SIGN
16966  062702     007  006  005        .BYTE   007,006,005,004,003,002,001     ;DECIMAL STRING FOR SRC1
16967  062705     004  003  002
16968  062710     001
16969          062712                  .EVEN
16970  062712  000000          CMP2A:  .WORD   0                               ;SRC2 SIGN
16971  062714     000                  .BYTE                                   ;DECIMAL STRING FOR SRC2
16972          062716                  .EVEN
16973
16974  062716  17777           CMP3:   .WORD   -1                              ;SRC1 SIGN
16975  062720     000                  .BYTE                                   ;DECIMAL STRING FOR SRC1
16976          062722                  .EVEN
```

```
16977  062722  177777                  CMP3A:  .WORD   -1                              ;SRC2 SIGN
16978  062724     001     000     011          .BYTE   001,000,011,000,002,000,010,000,003,000,007,000,004,000,004,000
16979  062727     000     002     000
16980  062732     010     000     003
16981  062735     000     007     000
16982  062740     004     000     004
16983  062743     000
16984                                                                              ;DECIMAL STRING FOR SRC2
16985                              .EVEN
16986
16987  062744  177777                  CMP4:   .WORD   -1                                      ;SRC1 SIGN
16988  062746     001     002     003          .BYTE   001,002,003,000,005,006,007,010,011     ;DECIMAL STRING FOR SRC1
16989  062751     000     005     006
16990  062754     007     010     011
16991          062760                       .EVEN
16992  062760  177777                  CMP4A:  .WORD   -1                                      ;SRC2 SIGN
16993  062762     001     002     003          .BYTF   001,002,003,004,005,006,007,010,011     ;DECIMAL STRING FOR SRC2
16994  062765     004     005     006
16995  062770     007     010     011
16996          062774                       .EVEN
16997
16998  062774  000000                  CMP5:   .WORD   0                               ;SRC1 SIGN
16999  062776     002     001     004          .BYTE   002,001,004,011,040,007         ;DECIMAL STRING FOR SRC1
17000  063001     011     040     007
17001                              .EVEN
17002  063004  000000                  CMP5A:  .WORD   0                               ;SRC2 SIGN
17003  063006     002     001     004          .BYTE   002,001,004,011,040,007         ;DECIMAL STRING FOR SRC2
17004  063011     011     040     007
17005                              .EVEN
17006
17007  063014  177777                  CMP6:   .WORD   -1                              ;SRC1 SIGN
17008  063016     004                          .BYTE   004                             ;DECIMAL STRING FOR SRC1
17009          063020                       .EVEN
17010  063020  000000                  CMP6A:  .WORD   0                               ;SRC2 SIGN
17011  063022     004                          .BYTE   004                             ;DECIMAL STRING FOR SRC2
17012          063024                       .EVEN
17013
17014  063024  000000                  CMP7:   .WORD   0                               ;SRC1 SIGN
17015  063026     002     003     004          .BYTE   002,003,004,005,006,007         ;DECIMAL STRING FOR SRC1
17016  063031     005     006     007
17017                              .EVEN
17018  063034  000000                  CMP7A:  .WORD   0                               ;SRC2 SIGN
17019  063036     003     004     005          .BYTE   003,004,005,006,007             ;DECIMAL STRING FOR SRC2
17020  063041     006     007
17021          063044                       .EVEN
17022
17023
17024
17025
17026                          .SBTTL  TEST CASES FOR ASHN AND ASHP
17027                          ;*****************************************************************
17028                          ;
17029                          ; TABLE OF TEST CASES FOR ASHN AND ASHP
17030                          ;
17031                          ;*****************************************************************
17032
```

```
17033  063044  000017                  TASH:   .WORD   15.             ;# OF TEST CASES FOR ASHN & ASHP
17034
17035  063046  000005                          .WORD   5                       ;SRC LENGTH
17036  063050  000005                          .WORD   5                       ;DST LENGTH
17037  063052     000                          .BYTE   0                       ;SHIFT COUNT
17038  063053     000                          .BYTE   0                       ;ROUNDING DIGIT
17039
17040  063054  000000                          .WORD   0               ;TEST CASE NUMBER 2
17041  063056  000017                          .WORD   17
17042  063060     000                          .BYTE   0
17043  063061     000                          .BYTE   0
17044
17045  063062  000032                          .WORD   32              ;TEST CASE NUMBER 3
17046  063064  000032                          .WORD   32
17047  063066     000                          .BYTE   0
17048  063067     007                          .BYTE   7
17049
17050  063070  000025                          .WORD   25              ;TEST CASE NUMBER 4
17051  063072  000025                          .WORD   25
17052  063074     377                          .BYTE   -1
17053  063075     005                          .BYTE   5
17054
17055  063076  000014                          .WORD   14              ;TEST CASE NUMBER 5
17056  063100  000014                          .WORD   14
17057  063102     377                          .BYTE   -1
17058  063103     006                          .BYTE   6
17059
17060  063104  000006                          .WORD   6               ;TEST CASE NUMBER 6
17061  063106  000006                          .WORD   6
17062  063110     001                          .BYTE   1
17063  063111     006                          .BYTE   6
17064
17065  063112  000010                          .WORD   10              ;TEST CASE NUMBER 7
17066  063114  000011                          .WORD   11
17067  063116     001                          .BYTE   1
17068  063117     000                          .BYTE   0
17069
17070  063120  000005                          .WORD   5               ;TEST CASE NUMBER 8
17071  063122  000006                          .WORD   6
17072  063124     002                          .BYTE   2
17073  063125     000                          .BYTE   0
17074
17075  063126  000016                          .WORD   16              ;TEST CASE NUMBER 9
17076  063130  000004                          .WORD   4
17077  063132     363                          .BYTE   -15
17078  063133     000                          .BYTE   0
17079
17080  063134  000020                          .WORD   20              ;TEST CASE NUMBER 10
17081  063136  000010                          .WORD   10
17082  063140     360                          .BYTE   -20
17083  063141     000                          .BYTE   0
17084
17085  063142  000012                          .WORD   12              ;TEST CASE NUMBER 11
17086  063144  000007                          .WORD   7
17087  063146     006                          .BYTE   6
17088  063147     000                          .BYTE   0
```

```
 17089
 17090  063150  000037                    .WORD   37              ;TEST CASE NUMBER 12
 17091  063152  000030                    .WORD   30
 17092  063154     030                    .BYTE   30
 17093  063155     000                    .BYTE   0
 17094
 17095  063156  000020                    .WORD   20              ;TEST CASE NUMBER 13
 17096  063160  000010                    .WORD   10
 17097  063162     373                    .BYTE   -5
 17098  063163     000                    .BYTE   0
 17099
 17100  063164  000005                    .WORD   5               ;TEST CASE NUMBER 14
 17101  063166  000005                    .WORD   5
 17102  063170     373                    .BYTE   -5
 17103  063171     006                    .BYTE   6
 17104
 17105  063172  000007                    .WORD   7               ;TEST CASE NUMBER 15
 17106  063174  000007                    .WORD   7
 17107  063176     366                    .BYTE   -12
 17108  063177     006                    .BYTE   6
 17109
 17110
```

```
17111                                   .SBTTL  ADDN/SUBN TEST DATA
17112                                   ;;*****************************************************************
17113                                   ;
17114                                   ;       TABLES FOR ADDN AND SUBN
17115                                   ;
17116                                   ;;*****************************************************************
17117
17118
17119  063200  000006           TADD:   .WORD   6               ;# OF TEST CASES
17120
17121  063202  000020                   .WORD   16.             ;SRC1 LENGTH
17122  063204  063356                   .WORD   ADD1            ;SRC1 PTR
17123  063206  000021                   .WORD   17.             ;SRC2 LENGTH
17124  063210  063400                   .WORD   ADD1A           ;SRC2 PTR
17125  063212  000024                   .WORD   20.             ;DEST LENGTH
17126  063214  063424                   .WORD   ADD1B           ;DEST PTR (SUM)
17127  063216  000000                   .WORD   0               ;CC.EXP (SUM)
17128  063220  063452                   .WORD   ADD1C           ;DEST PTR (DIFF)
17129  063222  000000                   .WORD   0               ;CC.EXP (DIFF)
17130
17131  063224  000012                   .WORD   10.             ;SRC1 >SRC2, SUM +,DIFF -
17132  063226  063500                   .WORD   ADD2
17133  063230  000012                   .WORD   10.
17134  063232  063514                   .WORD   ADD2A
17135  063234  000012                   .WORD   10.
17136  063236  063530                   .WORD   ADD2B
17137  063240  000000                   .WORD   0
17138  063242  063544                   .WORD   ADD2C
17139  063244  000010                   .WORD   10
17140
17141  063246  000013                   .WORD   11.             ;SRC1 +,SRC2 -, SUM & DIFF -
17142  063250  063560                   .WORD   ADD3
17143  063252  000013                   .WORD   11.
17144  063254  063576                   .WORD   ADD3A
17145  063256  000014                   .WORD   12.
17146  063260  063614                   .WORD   ADD3B
17147  063262  000010                   .WORD   10
17148  063264  063632                   .WORD   ADD3C
17149  063266  000010                   .WORD   10
17150
17151  063270  000020                   .WORD   16.             ;SRC1 -,SRC2 -,SUM -, DIFF +
17152  063272  063650                   .WORD   ADD4
17153  063274  000003                   .WORD   3
17154  063276  063672                   .WORD   ADD4A
17155  063300  000020                   .WORD   16.
17156  063302  063700                   .WORD   ADD4B
17157  063304  000010                   .WORD   10
17158  063306  063722                   .WORD   ADD4C
17159  063310  000000                   .WORD   0
17160
17161  063312  000016                   .WORD   14.             ;SRC1 = +,SRC2 0,DEST TRUNCATED WITH
17162                                                           ;SUM = +,DIFF = -
17163  063314  063744                   .WORD   ADD5
17164  063316  000001                   .WORD   1
17165  063320  063764                   .WORD   ADD5A
17166  063322  000011                   .WORD   9.
```

```
17167  063324  063770                          .WORD   ADD5B
17168  063326  000002                          .WORD   2
17169  063330  064004                          .WORD   ADD5C
17170  063332  000012                          .WORD   12
17171
17172  063334  000010                          .WORD   8.              ;DEST LENGTH = 0
17173  063336  064020                          .WORD   ADD6
17174  063340  000011                          .WORD   9.
17175  063342  064032                          .WORD   ADD6A
17176  063344  000000                          .WORD   0
17177  063346  064046                          .WORD   ADD6B
17178  063350  000006                          .WORD   6
17179  063352  064046                          .WORD   ADD6B
17180  063354  000006                          .WORD   6
17181
17182  063356  000000                  ADD1:   .WORD   0               ;SIGN1
17183  063360     005      011      007        .BYTF   5,9.,7,4,3,8.,1,6,6,7,8.,1,2,9.,0,6
17184  063363     004      003      010
17185  063366     001      006      006
17186  063371     007      010      001
17187  063374     002      011      000
17188  063377     006
17189                                          ;SOURCE STRING 1
17190
17191                                  .EVEN
17192  063400  000000                  ADD1A:  .WORD   0               ;SIGN2
17193  063402     001      007      004        .BYTE   1,7,4,3,2,1,6,9.,5,3,4,7,9.,4,1,6,2
17194  063405     003      002      001
17195  063410     006      011      005
17196  063413     003      004      007
17197  063416     011      004      001
17198  063421     006      002
17199                                          ;SOURCE STRING 2
17200
17201          063424                  .EVEN
17202  063424  000000                  ADD1B:  .WORD   0               ;SIGN3
17203  063426     000      000      000        .BYTE   0,0,0,2,3,4,0,6,5,5,1,2,0,2
17204  063431     002      003      004
17205  063434     000      006      005
17206  063437     005      001      002
17207  063442     000      002
17208  063444     006      000      007        .BYTE   6,0,7,0,6,8.
17209  063447     000      006      010
17210                                          ;DEST STRING
17211                                  .EVEN
17212
17213  063452  000000                  ADD1C:  .WORD   0
17214  063454     000      000      000        .BYTE   0,0,0,1,1,4,5,7,7,8.,7,8.,6
17215  063457     001      001      004
17216  063462     005      007      007
17217  063465     010      007      010
17218  063470     006
17219  063471     006      011      010        .BYTE   6,9.,8.,1,2,5,6
17220  063474     001      002      005
17221  063477     006
17222                                  .EVEN
```

```
17223
17224  063500  000000                    ADD2:   .WORD   0
17225  063502     003      001     005           .BYTE   3,1,5,9.,2,6,5,3,8.,0
17226  063505     011      002     006
17227  063510     005      003     010
17228  063513     000
17229                                     .EVEN
17230
17231  063514  000000                    ADD2A:  .WORD   0
17232  063516     001      007     006           .BYTE   1,7,6,3,2,1,4,1,7,2
17233  063521     003      002     001
17234  063524     004      001     007
17235  063527     002
17236                                     .EVEN
17237
17238  063530  000000                    ADD2B:  .WORD   0
17239  063532     004      011     002           .BYTE   4,9.,2,2,4,7,9.,5,5,2
17240  063535     002      004     007
17241  063540     011      005     005
17242  063543     002
17243                                     .EVEN
17244
17245  063544  177777                    ADD2C:  .WORD   -1
17246  063546     001      003     011           .BYTE   1,3,9.,6,0,5,1,2,0,8.
17247  063551     006      000     005
17248  063554     001      002     000
17249  063557     010
17250                                     .EVEN
17251
17252  063560  000000                    ADD3:   .WORD   0
17253  063562     004      002     003           .BYTE   4,2,3,1,1,7,9.,6,7,9.,6
17254  063565     001      001     007
17255  063570     011      006     007
17256  063573     011      006
17257          063576                     .EVEN
17258
17259  063576  177777                    ADD3A:  .WORD   -1
17260  063600     007      011     003           .BYTE   7,9.,3,6,5,2,2,2,7,8.,1
17261  063603     006      005     002
17262  063606     002      002     007
17263  063611     010      001
17264          063614                     .EVEN
17265
17266  063614  177777                    ADD3B:  .WORD   -1
17267  063616     000      003     007           .BYTE   0,3,7,0,5,3,4,2,5,9.,8.,5
17268  063621     000      005     003
17269  063624     004      002     005
17270  063627     011      010     005
17271                                     .EVEN
17272
17273  063632  177777                    ADD3C:  .WORD   -1
17274  063634     001      002     001           .BYTE   1,2,1,6,7,7,0,1,9.,5,7,7
17275  063637     006      007     007
17276  063642     000      001     011
17277  063645     005      007     007
17278                                     .EVEN
```

```
17279
17280  063650  177777                  ADD4:   .WORD   -1
17281  063652     004     007     002          .BYTE   4,7,2,9.,3,2,7,7,1,6,1,7,9.,2,8.,4
17282  063655     011     003     002
17283  063660     007     007     001
17284  063663     006     001     007
17285  063666     011     002     010
17286  063671     004
17287                                   .EVEN
17288
17289  063672  177777                  ADD4A:  .WORD   -1
17290  063674     011     003     007          .BYTE   9.,3,7
17291          063700                       .EVEN
17292
17293  063700  177777                  ADD4B:  .WORD   -1
17294  063702     004     007     002          .BYTE   4,7,2,9.,3,2,7,7,1,6
17295  063705     011     003     002
17296  063710     007     007     001
17297  063713     006
17298  063714     001     010     000          .BYTE   1,8.,0,2,2,1
17299  063717     002     002     001
17300                                   .EVEN
17301
17302  063722  000000                  ADD4C:  .WORD   0
17303  063724     004     007     002          .BYTE   4,7,2,9.,3,2,7,7,1,6
17304  063727     011     003     002
17305  063732     007     007     001
17306  063735     006
17307  063736     001     007     010          .BYTE   1,7,8.,3,4,7
17308  063741     003     004     007
17309                                   .EVEN
17310
17311  063744  000000                  ADD5:   .WORD   0
17312  063746     004     000     001          .BYTE   4,0,1,7,7,7,9.,6,3,2,5,8.,8.,1
17313  063751     007     007     007
17314  063754     011     006     003
17315  063757     002     005     010
17316  063762     010     001
17317                                   .EVEN
17318
17319  063764  000000                  ADD5A:  .WORD   0
17320  063766     000                          .BYTE   0
17321          063770                       .EVEN
17322
17323  063770  000000                  ADD5B:  .WORD   0
17324  063772     007     011     006          .BYTE   7,9.,6,3,2,5,8.,8.,1
17325  063775     003     002     005
17326  064000     010     010     001
17327          064004                       .EVEN
17328
17329  064004  177777                  ADD5C:  .WORD   -1
17330  064006     007     011     006          .BYTE   7,9.,6,3,2,5,8.,8.,1
17331  064011     003     002     005
17332  064014     010     010     001
17333          064020                       .EVEN
17334
```

```
17335  064020  000000                  ADD6:   .WORD   0
17336  064022     001     007     011          .BYTE   1,7,9.,3,3,9.,8.,1
17337  064025     003     003     011
17338  064030     010     001
17339                                          .EVEN
17340
17341  064032  000000                  ADD6A:  .WORD   0
17342  064034     010     010     003          .BYTE   8.,8.,3,9.,2,7,6,4,9.
17343  064037     011     002     007
17344  064042     006     004     011
17345          064046                          .EVEN
17346
17347  064046  000000                  ADD6B:  .WORD   0
17348  064050     000                          .BYTE   0
17349          064052                          .EVEN
17350
17351                                  ;+
17352                                  ;       INLINE TEST CASE        (ADDNI & SUBNI)
17353                                  ;-
17354
17355  064052  010020                  TADDI:  .WORD   010020          ;SRC1 DESCRIPTOR
17356  064054  062370                          .WORD   #DSBUF1
17357  064056  010021                          .WORD   010021          ;SRC2 DESCRIPTOR
17358  064060  062432                          .WORD   #DSBUF2
17359  064062  010024                          .WORD   010024          ;DEST DESCRIPTOR
17360  064064  062474                          .WORD   #DS.DST
17361
17362                                  ;+
17363                                  ;       INLINE TEST CASE        (ADDPI & SUBPI)
17364                                  ;-
17365
17366  064066  070020                  TADDPI: .WORD   070020
17367  064070  062370                          .WORD   #DSBUF1
17368  064072  070021                          .WORD   070021
17369  064074  062432                          .WORD   #DSBUF2
17370  064076  070024                          .WORD   070024
17371  064100  062474                          .WORD   #DS.DST
17372
17373
17374
17375
17376  064102                          INLINE  <SPACE: .BLKW   2000>
17377  064102  002000
17378  070102                          INLINE  <SPACEY:>                       SPACE:  .BLKW   2000
17379  070102                                                                  SPACEY:
17380
17381
17382
17383          000001                  .END
```

```
ADDN  = 076050          191#  9935
ADDNI = 076150          200#  10110
ADDP  = 076070          211#  12966
ADDPI = 076170          220#  13124
ADD1    063356        10061   10980   17122   17182#
ADD1A   063400        10077   10996   17124   17192#
ADD1B   063424        10093   17126   17202#
ADD1C   063452        11012   17128   17213#
ADD2    063500        17132   17224#
ADD2A   063514        17134   17231#
ADD2B   063530        17136   17238#
ADD2C   063544        17138   17245#
ADD3    063560        17142   17252#
ADD3A   063576        17144   17259#
ADD3B   063614        17146   17266#
ADD3C   063632        17148   17273#
ADD4    063650        17152   17280#
ADD4A   063672        17154   17289#
ADD4B   063700        17156   17293#
ADD4C   063722        17158   17302#
ADD5    063744        17163   17311#
ADD5A   063764        17165   17319#
ADD5B   063770        17167   17323#
ADD5C   064004        17169   17329#
ADD6    064020        17173   17335#
ADD6A   064032        17175   17341#
ADD6B   064046        17177   17179   17347#
ADR.A   002172          565     574     663     746#    785     794
ALPHA   002200          615     622     746     749#    835     842
ALTBUF  055454         1072    1096    1688    1712    2183    2207    16005#
APTCSU= 000040        16436   16765#
APTENV= 000001        16355   16431   16726   16763#
APTSIZ= 000200          454   16762#
APTSPO= 000100        16433   16728   16764#
ASHN  = 076056          197#  12544
ASHNI = 076156          206#  12697
ASHP  = 076076          217#  14511
ASHPI = 076176          226#  14634
ASSEMB= 000010            1
ASWREG= 000000          130#
BEGIN   001510          481     484#  15837
BETA    002204          629     636     747     751#    849     856
BFADRS  000540          353#   1054*  1078*  1319*  1323*  1670*  1694*  1914*  1918*  2165*  2189*  2438*  2442*
                       2698*  2790*  2984*  3076*  3264*  3372*  3577*  3682*  3856*  3860*  4017*  4021*  4204*
                       4208*  4364*  4368*  15937   15974   16011
BF.EXP  000536          352#  1105*  1110*  1201    1224    1269*  1274*  1286    1718*  1878    2213*  2405
BIT0    000001          115#   520
BIT00 = 000001          105#   115     2644    2930    3214    3527    3838    4182    13851   13923   14187   14361   14461
                       16209
BIT01 = 000002          104#   114
BIT02 = 000004          103#   113
BIT03 = 000010          102#   112
BIT04 = 000020          101#   111
BIT05 = 000040          100#   110
BIT06 = 000100           99#   109
BIT07 = 000200           98#   108     4544    6429    6439    11894   11952   12027   12223   12320   12381   12444   12507
```

```
                    14230   14292   14406   14413
BIT08 = 000400       97#     107
BIT09 = 001000       96#     106
BIT1  = 000002      114#    4726
BIT10 = 002000       95#
BIT11 = 004000       94#   16266
BIT12 = 010000       93#
BIT13 = 020000       92#   16349
BIT14 = 040000       91#   16264
BIT15 = 100000       90#
BIT2  = 000004      113#    9258
BIT3  = 000010      112#   12830
BIT4  = 000020      111#   14766
BIT5  = 000040      110#   15181
BIT6  = 000100      109#    4554
BIT7  = 000200      108#
BIT8  = 000400      107#    4615
BIT9  = 001000      106#
BPTVEC= 000014      122#
BUFF1   061166     1319    1446    1454    1462    1470    1478    1486    1494    1500    1508    1516    1524    1532
                   1540    1548    1556    1565    1914    2040    2048    2054    2062    2064    2070    2438    2567
                   2575    2581    2589    2597    2640    2670    2679    2698    2702    2790    2796    2826    2883
                   2926    2956    2965    2984    2988    3076    3082    3113    3166    3208    3236    3245    3264
                   3268    3372    3376    3424    3478    3521    3549    3558    3577    3581    3682    3686    3731
                   3785    3828    3856    3868    4017    4027    4135    4176    4204    4221    4227    4364    4372
                   4378    4406    4470   16892#
BUFF2   061266     1323    1401    1408    1415    1417    1444    1452    1460    1468    1476    1484    1492    1502
                   1510    1518    1526    1534    1542    1550    1558    1567    1918    1996    2003    2012    2023
                   2038    2046    2056    2072    2442    2522    2529    2536    2550    2565    2573    2583    2591
                   2599    3832    3860    3876    4021    4137    4180    4208    4368    4472   16893#
BUFLEN= 000100       25#    1263    1282    1418    1477    1507    1870    1886    2023    2393    2397    2550    2817
                   2882    3103    3165    3415    3470    3473    3474    3477    3722    3777    3780    3781    3784
CBIT  = 000001       59#    1028    1644    2139    6018    6498
CC      000516      344#     582*    584*    596     606     802*    804*    816     826    1126*   1128*   1130    1732*
                  1734*   1736    2253*   2255*   2257    2719*   2721*   2723    3005*   3007*   3009    3301*   3303*
                  3305    3611*   3613*   3615    3946*   3948*   3950    4293*   4295*   4297    4389*   4391    5000*
                  5002*   5004    5108*   5110*   5112    5584*   5586*   5588    5692*   5694*   5696    6054*   6056*
                  6058    6134*   6136*   6138    6530*   6532*   6534    6610*   6612*   6614    7549*   7551*   7553
                  7658*   7660*   7662    8278*   8280*   8282    8382*   8384*   8386    9942*   9944*   9946   10118*
                 10120*  10122   10860*  10862*  10864   11037*  11039*  11041   11662*  11664*  11666   11772*  11774*
                 11776   12551*  12553*  12555   12705*  12707*  12709   12973*  12975*  12977   13132*  13134*  13136
                 13341*  13343*  13345   13502*  13504*  13506   13995*  13997*  13999   14067*  14069*  14071   14514*
                 14516*  14518   14642*  14644*  14646   14910*  14912*  14914   15068*  15070*  15072   15330*  15332*
                 15334   15492*  15494*  15496
CC.EXP  000520      345#    1024*   1026*   1028    1030    1130    1640*   1642*   1644    1646    1736    2135*   2137*
                   2139    2141    2257    2694*   2696*   2723    2980*   2982*   3009    3260*   3262*   3305    3573*
                   3575*   3615    3870*   3878*   3930*   3950    4277*   4279*   4297    4788*   4796*   4803*   4824*
                   4849*   4936*   5004    5317*   5328*   5333*   5350*   5369*   5397*   5437*   5456*   5490*   5517*
                   5588    5902*   5914*   5999*   6018*   6058    6325*   6339*   6388*   6432*   6462*   6490*   6498*
                   6534    7079*   7255*   7272*   7285*   7375    7406*   7420*   7432*   7466    7487    7511    7553
                   7847*   8109*   8127*   8140*   8282    9334*   9946   10246*  10250*  10864   11128*  11214*  11224*
                  11234*  11253*  11267*  11277*  11316*  11326*  11335*  11666   11846*  11911*  11944*  11976*  11985*
                  12018*  12036*  12043*  12100   12103*  12208   12239*  12271   12274*  12305   12366   12429   12456*
                  12492   12519*  12555   12906*  12977   13269*  13273*  13345   13460*  13602*  13684*  13694*  13704*
                  13723*  13737*  13747*  13786*  13796*  13805*  13999   14143*  14247*  14284*  14322*  14324*  14341*
                  14343*  14396*  14422*  14429*  14431*  14518   14843*  14914   15258*  15262*  15334   15449*
```

```
CHRSET  061766  3212  3274  3282  3284  3381  3384  3392  3480  3525  3587  3595  3597* 3691
                3694  3704* 3787  12913 13096 13280 13469 14850 15034 15269 15458 16895#
CIS4EN  015716   523  4661  4687#
CIS5EN  031700  4729  8438  9220#
CIS6EN  044432  9261  12777 12792#
CIS7EN  052020 12833  14714 14729#
CIS8EN  053140 14769  15145#
CIS9EN  055114 15184  15568 15800#
CKSWR = 104406   139# 16263 16342 16365
CLRBUF  055346  1059  1083  1325  1675  1699  1920  2170  2194  2440  2700  3266  3374  3579
                3684  4019  4023  4210  15931#
CLRDSB  055520  4780  5100  5309  5684  5900  5928  6126  6602  7077  7650  7845  7864  8374
                9313  10054 10225 10973 11126 11863 12670 12885 13070 13248 13439 13600 13823
               14141  14624 14822 15008 15237 15428 16043#
CLRREG  055330   560   780  2794  3080  3397  3702  4025  4381  5098  5682  6124  6600  7648
                8372  10107 11026 13120 13492 14632 15057 15481 15902#
CMPC  = 076044   176# 3939
CMPCI = 076144   186# 4032
CMPN  = 076052   193# 11655
CMPNI = 076152   202# 11766
CMPNI1  041376 11815  11817 11819#
CMPP  = 076072   213# 13988
CMPPI = 076172   222# 14061
CMPPI1  050216 14111  14113 14115#
CMP1    062670 16923  16958#
CMP1A   062674 16925  16961#
CMP2    062700 16928  16965#
CMP2A   062712 16930  16970#
CMP3    062716 16933  16974#
CMP3A   062722 16935  16977#
CMP4    062744 16938  16987#
CMP4A   062760 16940  16992#
CMP5    062774 16943  16998#
CMP5A   063004 16945  17002#
CMP6    063014 16948  17007#
CMP6A   063020 16950  17010#
CMP7    063024 16953  17014#
CMP7A   063034 16955  17018#
COUNT   000466   332#   550*  562   593   650   672*  674   770*  782   813   877*  879   965*
                1010  1303* 1306  1582* 1626  1898* 1901  2086* 2422* 2425  2613* 2644  2774*
                2777  2897* 2930  3060* 3063  3181* 3214  3356* 3359  3494* 3527  3666* 3669
                3801* 3838  4001* 4004  4151* 4182  4348* 4351  4755* 4959  5083* 5086  5284*
                5543  5667* 5670  5848* 5875  6110* 6113  6273* 6300  6586* 6589  7020* 7051
                7634* 7637  7819* 8357* 8360  9288* 10039* 10042 10200* 10958* 10961 11119* 11738*
               11741  11837* 12652* 12657 12860* 13055* 13058 13223* 13424* 13427 13593* 14032* 14035
               14132* 14605* 14610  14797* 14993* 14996  15212* 15413* 15416
CR    = 000015    19# 16474
CRLF  = 000200    20# 16445
CTL     000544   355#   530* 4735* 9267* 12839* 14775* 15190* 16393
CTLTBL  056570 16396  16407#
CTL4    060662 16407  16838#
CTL5    060677 16408  16841#
CTL6    060714 16409  16844#
CTL7    060731 16410  16847#
CTL8    060746 16411  16850#
CTL9    060763 16412  16853#
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CVTIL    031266          5982    6485    8980#
CVTLI    030362          4786    5315    8578#
CVTLN =  076057           198#   5576
CVTLNI=  076157           207#   5686
CVTLP =  076077           218#   4992
CVTLPI=  076177           227#   5102
CVTNAA   024267          6818    6963#
CVTNBB   024272          6821    6966#
CVTNCC   024275          6824    6969#
CVTNDD   024300          6827    6972#
CVTNEE   024303          6830    6975#
CVTNFF   024306          6833    6978#
CVTNGG   024311          6836    6981#
CVTNHH   024314          6839    6984#
CVTNII   024317          6842    6987#
CVTNJJ   024322          6845    6990#
CVTNL =  076053           194#   6522
CVTNLA   024141          6740    6882#
CVTNLB   024154          6743    6888#
CVTNLC   024157          6746    6891#
CVTNLD   024162          6749    6894#
CVTNLE   024165          6752    6897#
CVTNLF   024170          6755    6900#
CVTNLG   024173          6758    6903#
CVTNLH   024176          6761    6906#
CVTNLI=  076153           203#   6604
CVTNLJ   024204          6767    6912#
CVTNLK   024207          6770    6915#
CVTNLL   024212          6773    6918#
CVTNLM   024215          6776    6921#
CVTNLN   024220          6779    6924#
CVTNLO   024223          6782    6927#
CVTNLP   024226          6785    6930#
CVTNLQ   024231          6788    6933#
CVTNLR   024234          6791    6936#
CVTNLS   024237          6794    6939#
CVTNLT   024242          6797    6942#
CVTNLU   024245          6800    6945#
CVTNLV   024250          6803    6948#
CVTNLW   024253          6806    6951#
CVTNLX   024256          6809    6954#
CVTNLY   024261          6812    6957#
CVTNLZ   024264          6815    6960#
CVTNL$   024201          6764    6909#
CVTNL1   024065          6713    6848#
CVTNL2   024067          6716    6851#
CVTNL3   024071          6719    6854#
CVTNL4   024077          6722    6858#
CVTNL5   024104          6725    6862#
CVTNL6   024114          6728    6867#
CVTNL7   024117          6731    6870#
CVTNL8   024125          6734    6874#
CVTNL9   024133          6737    6878#
CVTNP =  076055           196#   8271
CVTNPI=  076155           205#   8376
CVTNP1   030216          8449    8485#
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CVTNP2  030222          8453    8489#
CVTNP3  030226          8457    8493#
CVTNP4  030232          8461    8497#
CVTNP5  030260          8465    8507#
CVTNP6  030272          8469    8513#
CVTNP7  030306          8473    8519#
CVTNP8  030330          8477    8527#
CVTNP9  030340          8481    8532#
CVTPL   = 076073         214#   6046
CVTPLI  = 076173         223#   6128
CVTPL1  022250          6212    6230#
CVTPL2  022251          6215    6232#
CVTPL3  022254          6218    6234#
CVTPL4  022257          6221    6236#
CVTPL5  022265          6224    6239#
CVTPL6  022271          6227    6242#
CVTPN   = 076054         195#   7541
CVTPNI  = 076154         204#   7652
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CVTPN2  026353          7736    7772#
CVTPN3  026354          7740    7774#
CVTPN4  026357          7745    7776#
CVTPN5  026372          7749    7781#
CVTPN6  026376          7753    7784#
CVTPN7  026402          7757    7787#
CVTPN8  026405          7761    7789#
CVTPN9  026413          7765    7792#
DATA00  000560           364#    979*   1000    1190    1216    1237    1240   1596*   1616    1794    1800    1835    1847
                        2100*   2121    2321    2347    2369    2372   2626*   2638    2665    2671    2676   2911*   2924
                         2951    2957    2962   3195*    3206    3231    3237    3242   3508*    3519    3544    3550    3555
                        3815*   3826    3864    3905    3925   4165*    4178    4248    4254   4769*    4790    4915    4951
                        5298*   5319    5322    5535   5862*    5908    5984    6033   6287*    6333    6365    6509   7034*
                         7088    7108    7530   7833*    7872    7894    8055    8247   9322*    9341    9348    9433    9478
                         9500    9520    9538    9557    9579  10234*   10257   10264   10349   10394   10416   10436   10454
                        10473   10495  11141*   11161   11174   11209   11219   11242   11262   11272   11283   11291   11370
                        11379   11402   11406   11431   11460   11494   11642  11857*   11870   11908   11938   11955   12030
                        12079   12145   12151   12176   12180   12206   12221   12241   12245   12266   12279   12303   12318
                        12342   12364   12379   12407   12442   12505   12530  12894*   12916   12941  13079*   13099  13257*
                        13283   13309  13448*   13472  13615*   13636   13679   13689   13712   13732   13742   13753   13761
                        13831   13975  14152*   14167   14244   14262   14278   14288   14298   14402   14416   14450   14497
                       14831*   14853   14878  15017*   15037  15246*   15272   15298  15437*   15461
DATA01  000562           365#    981*    1002    1184   1598*    1618    1670    1799    1843   2102*    2123    2165    2313
                        2628*   2642    2705   2913*    2991   3197*    3231    3243    3246    3269   3510*    3544    3556
                         3559    3582   3817*    3830    3864    3915    3927   4167*    4212    4215    4252    4266    4269
                        4771*   4782    4955   5300*    5311    5539   5864*    5906    6035   6289*    6329    6446    6511
                        7036*   7103    7168    7532   7835*    7855    7866    8069    8176   9324*    9344  10236*   10260
                       11143*   11154   11231   11247   11250   11260   11381   11408   11436   11462   11481  11859*   11918
                        11928   11940   11959   11963   12033   12040   12052   12064   12113   12158   12164   12198   12202
                        12251   12255   12295   12299   12359   12425   12453   12466   12471   12516   12535   12574  12896*
                        12917  13081*   13100  13259*   13284  13450*   13473  13617*   13629   13701   13717   13720   13730
                        13828   13836   13881  14154*   14254   14280   14290   14301   14309   14326   14345   14404   14419
                        14426   14441   14452   14502   14545  14833*   14854   15019*  15038   15248*  15273  15439*   15462
DATA02  000564           366#    983*    1004    1102    1190    1193    1236    1263    1278   1600*    1620    1794    1797
                         1801    1834    1846    1850    1870    1874   2104*    2125    2321    2324    2371    2393    2401
                        2630*   2665    2677    2680    2703   2915*    2951    2963    2966    2989   3819*    3836    3890
                         3893    3896    3899    3905    3915    3925    3927   4773*    4784    4957   5302*    5313    5541
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                    7038*  7091   7161   7299   7352   7356   7369   7373   7396   7400   7424   7437   7460
                    7485   7507   7534   7837*  8038   8046   8058   8251   9326*  9370   9377   9440   9622
                    9644   9664   9682   9700   9722   10238* 10286  10293  10356  10540  10562  10582  10600
                   10618  10640  11145* 11188  11211  11229  11244  11262  11272  11283  11516  11525  11549
                   11596  11630  11647  11861* 11892  11952  11968  11999  12027  12221  12223  12318  12320
                   12379  12381  12442  12444  12505  12507  12540  12898* 12923  12946  13083* 13106  13261*
                   13290  13314  13452* 13479  13619* 13658  13681  13699  13714  13732  13742  13753  13903
                   13980  14156* 14228  14292  14314  14368  14406  14413  14507  14835* 14860  14883  15021*
                   15044  15250* 15279  15303  15441* 15468
DATA03  000566      367#   985*  1006   1186   1239   1279   1281   1602*  1622   1694   1718   1792   1833
                    1845   1849   1873   1885   2106*  2127   2189   2213   2311   2368   2396   2400   9328*
                    9373  10240* 10289  11147* 11181  11221  11247  11527  11551  11574  11598  11617  12900*
                   12924  13085* 13107  13263* 13291  13454* 13480  13621* 13651  13691  13717  13900  13908
                   13953  14837* 14861  15023* 15045  15252* 15280  15443* 15469
DATA04  000570      368#   987*  1008   1244   1604*  1624   1826   2108*  2129   2376   9330*  9399   9406
                    9447   9765   9787   9789   9812   9815   9837   9840   9862   9884  10242* 10315  10322
                   10363  10683  10705  10707  10730  10733  10755  10758  10780  10802  12902* 12930  12951
                   13087* 13113  13265* 13297  13319  13456* 13486  14839* 14867  14888  15025* 15051  15254*
                   15286  15308  15445* 15475
DATA05  000572      369#   989*  1056   1064   1606*  1672   1680   2110*  2167   2175   9332*  9402  10244*
                   10248* 10318  12904* 12931  13089* 13114  13267* 13271* 13298  13458* 13462* 13487  14841*
                   14868  15027* 15052  15256* 15260* 15287  15447* 15451* 15476
DATA06  000574      370#   991*  1080   1088   1266   1274   1608*  1696   1704   2112*  2191   2199
DATTYP  000462      330#  5322*  5323*  5337   5356   5451   5464   5466   5470   5498   5500   5504   5984*
                    5985*  5987   6365*  6366*  6372   6374   6394   6396   6400   6443   6451   6453   7313*
                    7336*  7340   7364   7393   7412   7457   7481   7503   7535   7894*  7895*  7900   7927
                    7944   7970   7994   8014   8071   8099   9746*  9748*  9750   9774  10664* 10666* 10668
                   10692  11132* 11359  11362* 11375  11399  11428  11456  11476  11641  11725* 11728  11848*
                   12126* 12132* 12136  12171  12236  12263  12339  12400  12462  12531  12536  12575  13606*
DELAY   000470      333#  4501*  4507   4583*  4584*
DESCR0  000614      379#  9500*  9520*  9521*  9538*  9539*  9557*  9558*  9579*  9580*  9919  10416* 10436*
                   10437* 10454* 10455* 10473* 10474* 10495* 10496* 10837
DESCR1  000616      380#  9451*  9921  10367* 10839
DESCR2  000620      381#  9644*  9664*  9665*  9682*  9683*  9700*  9701*  9722*  9723*  9923  10562* 10582*
                   10583* 10600* 10601* 10618* 10619* 10640* 10641* 10841
DESCR3  000622      382#  9453*  9925  10369* 10843
DESCR4  000624      383#  9787*  9812*  9813*  9837*  9838*  9862*  9863*  9884*  9885*  9927  10705* 10730*
                   10731* 10755* 10756* 10780* 10781* 10802* 10803* 10845
DESCR5  000626      384#  9455*  9929  10371* 10847
DIAGMC= 000000        1
DISPLA  000430      312#   451*  16279* 16345*
DISPRE  000174      246#   312    451
DIVP  = 076075      216#  15323
DIVPI = 076175      225#  15484
DOIT    036566    10833#  10835
DOIT1   033776     9915#  9917
DSBUF1  062370      4832   4843   4870   5406   5448   5904   5923   6327   6348   6408   6471   6476   7870
                    7976   7985*  8020*  8025*  8249   8621   8674   8943   8954   8993   9350   9430   9432
                    9451   9475*  9477   9514*  9550*  9590*  9595*  10066  10266  10346  10348  10367  10391*
                   10393  10430* 10466* 10506* 10511* 10985  11157  11293  11367* 11369  11378  11393  11405
                   11434  11459  11479  11493  11644  11872  12148* 12150  12174* 12179  12244  12278  12348*
                   12353* 12406  12481* 12486* 12533  12673  12785  12918  12944  13101  13285  13312  13474
                   13632  13763  13826  13977  14165  14500  14626* 14628* 14630* 14724  14855  14881  15039
                   15274  15301  15463  15793  16049  169C0#  17356  17367
DSBUF2  062432      9379   9437   9439   9453   9619*  9621   9658*  9694*  9733*  9738*  10082  10295  10353
                   10355  10369  10530  10537* 10539  10576* 10612* 10651* 10656* 11001  11184  11295  11513*
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                    11515   11524   11539   11548   11572   11595   11615   11629   11649   12925   12949   13108   13292
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                    16904#  17358   17369
DSLEN1  000512        342#   4800    4812    4829    4834    4840    4851*   4855    4858    4872    4877    4880    4885*
                     4892   4904*   5330    5379    5403    5408    5412    5416    5431    5434    5908*   5909*   5911
                     5925   5930    5937*   5942    5964*   6333*   6334*   6336    6350    6352    6369    6410    7088*
                     7089*  7099    7110    7140    7143    7164    7266    7282    7427    7872*   7873*   7880    7903
                     7930   7947    7973    8055*   8056*   8061    8121    8137    8151    8154    8177    8589*   8643*
                     8956*  8957*
DSLEN2  000514        343#   4790*   4791*   4793    4809    4815    4829    4840    4845    4851    4855    4862    5319*
                     5320*  5325    5377    5384    5401    5412    5415    5431    5435    7091*   7140    7148    7250
                     7268   7282    7415    8058*   8059*   8106    8123    8137    8151    8159    8170
DSTADR= 000000      16168#  16169
DSTMP0  000552        358#   7296*   7350    7463    9430*   9475    9541   10346*  10391   10457   11159*  11367   12110*
                    12161   13634*
DSTMP1  000553        359#   7302*   7358    7439    9435*   9480    9523   10351*  10396   10439   11177*  11372   12116*
                    12166   13649*
DSTMP2  000554        360#   9437*   9619    9685   10353*  10537   10603   11186*  11513   13656*
DSTMP3  000555        361#   9442*   9624    9667   10358*  10542   10585   11201*  11518   13671*
DSTMP4  000556        362#   9444*   9762    9843   10360*  10680   10761
DSTMP5  000557        363#   9449*   9767    9818   10365*  10685   10736
DS.DST  062474        4953    5059    5066    5161    5179    5200    5266    5537    5643    5650    5745    5765    5831
                      7049    7322    7325    7537    7606    7693    7700    7707    7714    7802    8253    8335    8342
                      8417    8424    8431    8542    9455    9911   10000   10007   10163   10170   10371   10829   10919
                     10926   11082   11089   12470   12538   12584   12596   12741   12762   12787   12954   13031   13038
                     13177   13193   13322   13400   13407   13547   13563   14505   14555   14568   14678   14699   14726
                     14891   14969   14976   15113   15129   15311   15389   15396   15537   15553   15797   16908#  17360
                     17371
DS.EXP  062536        4798*   4819    4836    4847    4866    5061    5343*   5348*   5362*   5367*   5382    5410    5418
                      5478    5507    5645    7160    7236    7296    7298    7350*   7355    7367*   7372    7399    7436
                      7473*   7484    7506    7514*   7519*   7604    7611    8043    8174    8337    9408    9444    9446
                      9762*   9764    9804*   9854*   9895*   9900*  10002   10098   10165   10324   10360   10362   10680*
                     10682   10722*  10772*  10813*  10818*  10921   11017   11084   11921   11958   12045   12063   12082
                     12110   12112   12161*  12163   12196*  12201   12254   12298   12390   12394*  12424   12465   12496*
                     12501*  12512*  12598   12631   12636   12932   13033   13115   13179   13186   13299   13402   13488
                     13549   13556   14258   14305   14330   14349   14445   14566   14869   14971   15053   15115   15122
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END2    034242       9610   10030#
END21   037036      10382   10954#
END22   037032      10526   10949#
END23   037026      10671   10944#
END3    034236       9753   10025#
ERR     000550        357#    586*    806*   4490*   4647*   4741*   9273*  12845*  14781*  15196*  16357   16383
ERRFLG  000454        327#    532*   1188*   1198    1221    1255   1261*   1295    1339*   1431    1790*   1806    1839
                     1855    1890   1934*   2010*   2025    2319*   2329    2352    2387    2414    2539*   2552    4645*
                     4670    4678*  4737*   5063*   5068    5189*   5202    5647*   5652    5754*   5767    7608*   7613
                     8333*   8340   9269*  10004*  10009   10167*  10172   10923*  10928   11086*  11091   12592*  12603
                    12609*  12618  12757*  12760   12770*  12841*  13035*  13040   13190*  13195   13404*  13409   13560*
                    13565   14570*  14575   14581*  14590   14694*  14697   14705*  14777*  14973*  14978   15126*  15131
                    15192*  15393*  15398   15550*  15555   16278*  16343*
ERRHDR  061000       16381   16861#
ERROR   056274         599     609     618     625     632     639     646     656     666     696     701     708     715
                       722     729     736     819     829     838     845     852     859     866     873     899     904
                       911     918     925     932     939     946    1133    1140    1147    1154    1161    1168    1175
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                    1425   1739   1746   1753   1760   1767   1774   1781   1812   1829   1861   1881   1948
                    1957   1964   1971   1978   1985   1992   1999   2006   2019   2260   2267   2274   2281
                    2288   2295   2302   2335   2358   2379   2408   2474   2483   2490   2497   2504   2511
                    2518   2525   2532   2546   2726   2733   2740   2747   2754   2761   2768   2813   2822
                    2829   2836   2843   2850   2857   3012   3019   3026   3033   3040   3047   3054   3099
                    3109   3116   3123   3130   3137   3144   3308   3315   3322   3329   3336   3343   3350
                    3411   3420   3427   3434   3441   3448   3455   3618   3625   3632   3639   3646   3653
                    3660   3718   3727   3734   3741   3748   3755   3762   3953   3960   3967   3974   3981
                    3988   3995   4047   4054   4061   4068   4075   4082   4089   4300   4307   4314   4321
                    4328   4335   4342   4395   4402   4409   4416   4423   4430   4437   4444   4575   4657
                    5007   5014   5021   5028   5035   5042   5049   5074   5115   5122   5129   5136   5143
                    5150   5157   5166   5175   5185   5196   5591   5598   5605   5612   5619   5626   5633
                    5658   5699   5706   5713   5720   5727   5734   5741   5750   5761   6061   6068   6075
                    6082   6089   6096   6103   6141   6148   6155   6162   6169   6176   6183   6190   6197
                    6537   6544   6551   6558   6565   6572   6579   6617   6629   6641   6648   6655   7556
                    7563   7570   7577   7584   7591   7598   7619   7665   7677   7689   7696   7703   7710
                    7717   8285   8292   8299   8306   8313   8320   8327   8348   8389   8401   8413   8420
                    8427   8434   9949   9956   9963   9970   9977   9984   9991  10015  10125  10142  10154
                   10178  10867  10874  10881  10888  10895  10902  10909  10934  11044  11061  11073  11097
                   11669  11676  11683  11690  11697  11704  11711  11779  11791  11803  12558  12570  12580
                   12587  12621  12712  12724  12736  12746  12753  12768  12980  12987  12994  13001  13008
                   13015  13022  13046  13139  13156  13168  13201  13348  13355  13362  13369  13376  13383
                   13390  13415  13509  13526  13538  13571  14002  14014  14026  14074  14086  14098  14521
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                   14931  14938  14945  14952  14959  14984  15075  15092  15104  15137  15337  15344  15351
                   15358  15365  15372  15379  15404  15499  15516  15528  15561  16341#
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ERRTMP  000472       334#  16383*  16384*  16385*  16386*  16387  16393*  16394*  16395*  16396*  16397
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ERR1    061041     16403  16867#
ERR2    061072     16404  16872#
ERR3    061121     16405  16876#
GAMMA   002210       748    753#    863    870
GTSWR = 104405       138#    482
HT    = 000011        17#  16443
ILLMSG  060534     15889  16823#
ILLOP = 076033       231#   4655
ILLRES  055314       437   4659   4682  15889#
ILLTST  015574      4602   4639#
INC1    032404      9461#  10033
INC2    032770      9605#  10028
INC21   035170     10377#  10952
INC22   035554     10521#  10947
INC23   036144     10666#  10942
INC3    033354      9748#  10023
INTFLG  000456       328#
INTPAS  000460       329#   4498   4503*
INTST   015202      4448   4484#
IOTVEC= 000020       123#    439*    440*
LENGTH= 000004     16168#  16173
LF    = 000012        18#  16478
LKS   = 177546        24#
LOCC  = 076040       172#   2712
LOCCI = 076140       182#   2801
LOOP2   015402      4558#   4562
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LTCVEC= 000100            129#    447*
L2D0  = 076020            149#    569
L2D1  = 076021            150#
L2D2  = 076022            151#
L2D3  = 076023            152#
L2D4  = 076024            153#    578
L2D5  = 076025            154#
L2D6  = 076026            155#
L2D7  = 076027            156#    686
L3D0  = 076060            158#
L3D1  = 076061            159#
L3D2  = 076062            160#
L3D3  = 076063            161#    789
L3D4  = 076064            162#
L3D5  = 076065            163#    798
L3D6  = 076066            164#
L3D7  = 076067            165#    887
MATC  = 076045            177#   4286
MATCI = 076145            187#   4383
MFPT  = 000007            146#
MOVC  = 076030            169#   1119
MOVCI = 076130            179#   1341
MOVRC = 076031            170#   1725
MOVRCI= 076131            180#   1936
MOVTC = 076032            171#   2246    4564
MOVTCI= 076132            181#   2460
MSGADR  000546            356#    477*  15821*  15827*  15877*  15889*  16319*  16352*  16381*  16387*  16389*  16397*  16399*
                        16430   16448*  16544*  16585*  16587*  16591*  16605*  16617*  16637*  16687*  16691*  16696*
MULP  = 076074             215#  14903
MULPI = 076174             224#  15060
MUL1    054504           15575   15644#
MUL1A   054526           15577   15652#
MUL1B   054552           15579   15661#
MUL1C   054614           15581   15675#
MUL2    054656           15585   15689#
MUL2A   054664           15587   15694#
MUL2B   054676           15589   15699#
MUL2C   054714           15591   15706#
MUL3    054732           15595   15713#
MUL3A   054742           15597   15718#
MUL3B   054746           15599   15722#
MUL3C   054756           15601   15727#
MUL4    054766           15605   15625   15732#
MUL4A   054776           15607   15627   15737#
MUL4B   055002           15609   15629   15741#
MUL4C   055006           15611   15631   15745#
MUL5    055012           15615   15749#
MUL5A   055016           15617   15753#
MUL5B   055026           15619   15758#
MUL5C   055032           15621   15762#
MUL7    055036           15635   15768#
MUL7A   055046           15637   15772#
MUL7B   055054           15639   15776#
MUL7C   055066           15641   15781#
NBIT  = 000010              56#   4936   5350   5369   5456   5490   5517   5999   6388   6432   6462   6490   7255
                           7375   7406   7420   7432   7466   7487   7511   8109  11224  11234  11253  11267  11277
```

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                        11316   11326   11911   12103   12239   12274   13694   13704   13723   13737   13747   13786   13796
                        14247   14324   14343   14431
NL1             024334   6997    7001#
NP1             030354   8540    8544#
OFFSET          000510    341#   3836*   3867    3875
OVPNCH          055254   5494    7449    7473    7961    7985    9532    9550    9676    9694    9829    9854   10448   10466
                        10594   10612   10747   10772   11422   11450   11565   11588   12333   12394   15849#
PACK            055646  12919   12926   12933   13102   13109   13116   13286   13293   13300   13475   13482   13489   14856
                        14863   14870   15040   15047   15054   15275   15282   15289   15464   15471   15478   16167#
PHALT           056266  16322   16328#
PLI             022304   6250    6254#
PN1             026426   7800    7804#
PR0     =       000000     46#   4556
PR1     =       000040     47#
PR2     =       000100     48#
PR3     =       000140     49#
PR4     =       000200     50#
PR5     =       000240     51#
PR6     =       000300     52#
PR7     =       000340     53#   4494    4518    4590    4651
PS      =       177776     21#     22
PSW     =       177776     22#    534*    582     802    1024    1126    1640    1732    2135    2253    2694    2719    2807
                         2980   3005    3093    3260    3301    3405    3573    3611    3712    3946    4040    4277    4293
                         4389   4492    4494*   4556*   4590*   4600*   4649    4651*   4680*   4739*   5000    5108    5584
                         5692   6054    6134    6530    6610    7549    7658    8278    8382    9271*   9942   10118   10860
                        11037  11662   11772   12551   12705   12843*  12973   13132   13341   13502   13995   14067   14514
                        14642  14779*  14910   15068   15194*  15330   15492
PWRMSG          060630  16319  16833#
PWRVEC=         000024    124#    443*    444*   16289*  16290*  16299*  16305*  16317*  16318*
RDCHR   =       100407    140#  16683
RDLIN   =       104410    141#
RESREG          055614   4598    8959    9213   16106#
RESRTN          015660   4653    4668#
RESVEC=         000010    119#    437*    438*   4653*   4659*   4682*
R0.EXP          000522    346#   1034*   1039*   1040*   1137    1650*   1655*   1656*   1743    2145*   2150*   2151*   2264
                         2668*  2676*   2677*   2692    2730    2954*   2962*   2963*   2978    3016    3234*   3242*   3243*
                         3258   3312    3547*   3555*   3556*   3571    3622    3889*   3890*   3908*   3957    4236*   4257*
                         4265*  4266*   4275    4304    4975*   5011    5559*   5595    5871*   6065    6296*   6541    7045*
                         7560   8259*   8289    9305*   9953   10217*  10871   12877*  12984   13240*  13352   14814*  14921
                        15229*  15341
R1.EXP          000524    347#   1044*   1144    1660*   1750    2155*   2271    2670*   2671*   2679*   2680*   2737    2956*
                         2957*  2965*   2966*   3023    3236*   3237*   3245*   3246*   3319    3549*   3550*   3558*   3559*
                         3629   3892*   3893*   3910*   3911*   3964    4238*   4259*   4260*   4268*   4269*   4311    4977*
                         5018   5561*   5602    5873*   6072    6298*   6548    7047*   7567    8261*   8296    9960   10878
                        12991  13359   14928   15348
R2.EXP          000526    348#   1046*   1151    1662*   1757    2157*   2278    2684*   2744    2970*   3030    3250*   3326
                         3563*  3636    3895*   3896*   3918*   3971    4240*   4318    4979*   5025    5563*   5609    5916*
                         6003*  6008*   6012    6079    6341*   6492    6555    7539*   7574    8263*   8303    8989*   9007*
                         9009*  9029*   9031*   9051*   9053*   9073*   9075*   9095*   9097*   9117*   9137*   9157*   9177*
                         9195*  9202*   9207*   9967   10885   12998   13366   14935   15355
R3.EXP          000530    349#   1048*   1158    1664*   1764    2159*   2285    2686*   2751    2972*   3037    3252*   3333
                         3565*  3643    3898*   3899*   3920*   3921*   3978    4242*   4325    4981*   5032    5565*   5616
                         5918*  6001*   6005    6014    6086    6343*   6494    6562    7049*   7581    8265*   8310    8991*
                         9005*  9027*   9049*   9071*   9093*   9115*   9135*   9155*   9175*   9193*   9200*   9204    9974
                        10892  13005   13373   14942   15362
R4.EXP          000532    350#   1050*   1165    1666*   1771    2161*   2292    2688*   2758    2974*   3044    3254*   3340
```

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                    3567*  3650   3901*  3985   4244*  4332   4983*  5039   5567*  5623   5891*  6093   6316*
                    6569   7067*  7588   8267*  8317   9931*  9981   10849* 10899  12962* 13012  13330* 13380
                   14899*  14949  15319*  15369
R5.EXP   000534      351#   1052*  1172   1668*  1778   2163*  2299   2690*  2765   2976*  3051   3256*  3347
                    3569*  3657   3903*  3992   4246*  4339   4985*  5046   5569*  5630   5893*  6100   6318*
                    6576   7069*  7595   8269*  8324   9933*  9988   10851* 10906  12964* 13019  13332* 13387
                   14901*  14956  15321*  15376
SAVPSW   000612      378#   4492*  4600   4649*  4680
SAVREG   055562     4525    8585   8987   16079#
SAVR0    000576      372#   15933* 15950  15970*  15987  16007*  16024  16045*  16062  16081*  16108
SAVR1    000600      373#   15935* 15952  15972*  15989  16009*  16026  16047*  16064  16083*  16110
SAVR2    000602      374#   16085* 16112
SAVR3    000604      375#   16087* 16114
SAVR4    000606      376#   16089* 16116
SAVR5    000610      377#   16091* 16118
SCANC  = 076042      174#   3294
SCANCI = 076142      184#   3399
SETBUF   055410     1067    1091   1321   1683   1707   1916   2178   2202   2444   2792   2986   3078   3858
                    3862    4206   4366   4370   15968#
SGNDGT   023470     6416    6668#
SIGN0    000446      324#   4924   5340   5359   5453   5485   5512   6331*  6386*  6434*  6460*  6487   7114*
                    7122*  7127*  7252   7417   7429   7442   7855*  7908   7954   7978   7997   8017   8587*
                    8600*  8612   8658   9197   9346*  9361*  9502   9525   9543   9563   9587   10262* 10277*
                   10418   10441  10459  10479  10503  11130* 11260* 11264  11274  11313  11323  11841* 11906
                   12182   12204  12225  12269  12281  12301  12322  12345  12362  12383  12409  12427  12446
                   12478   12490  12509  12644* 12647  13604* 13730* 13734  13744  13783  13793  14136* 14172
                   14207   14242  14260  14597* 14600
SIGN1    000450      325#   9375*  9390*  9646   9669   9687   9706   9730   10291* 10306* 10564  10587  10605
                   10624   10648
SIGN2    000452      326#   9404*  9421*  9792   9822   9847   9868   9892   10320* 10337* 10710  10740  10765
                   10786   10810
SKPC   = 076041      173#   2998
SKPCI  = 076141      183#   3087
SPACE    064102     4535    17377#
SPACEY   070102     17379#
SPACE1   060660     16389   16837#
SPANC  = 076043      175#   3604
SPANCI = 076143      185#   3706
SRCADR = 000002     16168#  16171
STACK  = 000776      12#
START    001200      255     425#  16329
STKLMT = 177774      23#
SUBN   = 076051      192#   10853
SUBNI  = 076151      201#   11029
SUBP   = 076071      212#   13334
SUBPI  = 076171      221#   13494
SWR      000426      311#    431    450*   456*   514    4720   9252   12824  14760  15175  16264  16266  16297
                   16310*  16349  16362  16574  16615*
SWREG    000176      247#    311    450   16574  16589
SW0    = 000001      87#
SW00   = 000001      77#     87
SW01   = 000002      76#     86
SW02   = 000004      75#     85
SW03   = 000010      74#     84
SW04   = 000020      73#     83
SW05   = 000040      72#     82
```

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SW06  = 000100              71#     81
SW07  = 000200              70#     80
SW08  = 000400              69#     79
SW09  = 001000              68#     78
SW1   = 000002              86#
SW10  = 002000              67#
SW11  = 004000              66#
SW12  = 010000              65#
SW13  = 020000              64#
SW14  = 040000              63#
SW15  = 100000              62#
SW2   = 000004              85#
SW3   = 000010              84#
SW4   = 000020              83#
SW5   = 000040              82#
SW6   = 000100              81#
SW7   = 000200              80#
SW8   = 000400              79#
SW9   = 001000              78#
TAB89   054304          14797   14799   15015   15212   15214   15435   15572#
TADD    063200           9288    9290   10200   10202   12860   12862   13077   13223   13225   13446   17119#
TADDI   064052          10063   10079   10095   10112   10114   10116   10982   10998   11014   11031   11033   11035   17355#
TADDPI  064066          13126   13128   13130   13181   13496   13498   13500   13551   17366#
TASH    063044          11837   11839   14132   14134   17033#
TASHNI  044422          12699   12701   12784#
TASHPI  052010          14636   14638   14723#
TBITVE= 000014            120#
TCMP    062576          11119   11121   13593   13595   16920#
TCMPC   014152           3801    3803    4099#
TCMPCI  014234           4034    4036    4134#
TCMPNI  041366          11768   11770   11814#
TCMPPI  050206          14063   14065   14110#
TCVLNI  021164           5688    5690    5829#
TCVLPI  017426           5104    5106    5264#
TCVNLI  024324           6606    6608    6645    6995#
TCVNPI  030344           8378    8380    8538#
TCVPLI  022274           6130    6132    6187    6194    6248#   6652
TCVPNI  026416           7654    7656    7798#
TCVTLN  021052           5284    5286    5778#
TCVTLP  017314           4755    4757    5213#
TCVTNL  023576           6273    6275    6710#
TCVTNP  030126           7819    7821    8446#
TCVTPL  022216           5848    5850    6209#
TCVTPN  026262           7020    7022    7729#
TEMP0   000474            335#    514*    515*     517     520    1281*   1282*   1293   1417*   1418*   1429   1833*   1834*
                         1835*   1837    1849*   1850*   1853    1885*   1886*   1888   2220*   2223*   2225   2396*   2397*
                         2398*   2412    2702*   2703*   2705*   2796*   2797*   2799*   2807*   2809    2817*   2819    2988*
                         2989*   2991*   3082*   3083*   3085*   3093*   3095    3103*   3104*   3106    3268*   3269*   3271*
                         3284*   3285*   3287*   3376*   3377*   3379*   3392*   3393*   3395*   3405*   3407    3415*   3417
                         3581*   3582*   3584*   3686*   3687*   3689*   3712*   3714    3722*   3724    3867*   3868*   3875*
                         3876*   3882*   4027*   4028*   4030*   4040*   4042*   4044    4221*   4222*   4224    4251*   4252*
                         4254    4496*   4566    4572    4618*   4673*   4674*   4720*   4721*   4723    4726    4815*   4817*
                         4820    4858*   4860*   4868    4899*   4900*   4902    5443*   5444*   5446    6352*   6358*   6360
                         6380*   6381*   6383    6414*   6424    8604*   8605*   8609   9252*   9253*   9255    9258    9432*
                         9433*   9435    9439*   9440*   9442    9446*   9447*   9449   9459*   9461*   9463    9487   10348*
                        10349*  10351   10355*  10356*  10358   10362*  10363*  10365  10375*  10377*  10379   10403   11892*
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                      11894   11897* 11901* 11956  12031  12040  12071  12406* 12407* 12412* 12417* 12424* 12425*
                      12433*  12438* 12449* 12465* 12466* 12468* 12470* 12471* 12473* 12574* 12575* 12577  12824*
                      12825*  12827  12830  14228* 14230  14233* 14237* 14299  14417  14426  14436  14448  14453
                      14545*  14546* 14548  14760* 14761* 14763  14766  15175* 15176* 15178  15181
TEMP1   000476          336#   4529*  4560*  4862*  4864*  4867   6420*  6424   8046*  8047*  8086   8101   9603*
                       9605*   9607   9631  10519* 10521* 10523  10549  11500* 11505  11508* 11521  11545  11569
                      11592   11612  11646  11715* 11718  12030* 12031* 12033  14416* 14417* 14419
TEMP2   000500          337#   9477*  9478*  9480*  9505*  9510*  9532*  9560   9582  10393* 10394* 10396* 10421*
                      10426*  10448* 10476  10498
TEMP3   000502          338#   9621*  9622*  9624*  9649*  9654*  9676*  9703   9725  10539* 10540* 10542* 10567*
                      10572*  10594* 10621  10643
TEMP4   000504          339#   4507*  4529   4568   4583   4623*  9764*  9765*  9767*  9795*  9800*  9829*  9865
                       9887   10682* 10683* 10685* 10713* 10718* 10747* 10783  10805
TEMP5   000506          340#   4613*  4615   5990*  5991*  5993   5995
TIMMSG  060466        15877   16816#
TIMOUT  055300          435   15877#
TITLE   060434          477   16811#
TKB    = 177562          29#  16578  16598  16655  16661
TKS    = 177560          28#  16576  16595  16621*  16653  16659
TKVEC  = 000060         127#
TLOCC   010372         2613   2615   2867#
TLOCCI  010416         2803   2882#
TMATC   015150         4151   4153   4454#
TMATCI  015172         4385   4387   4469#
TMOVC   004134          965    967   1441#
TMOVCI  004460         1343   1345   1564#
TMOVRC  006000         1582   1584   2035#
TMOVTC  007436         2086   2088   2562#
TMULPI  055100        15062  15064  15066  15117  15486  15488  15490  15541  15792#
TMVRCI  006072         1938   1940   2069#
TMVTCI  007530         2462   2464   2596#
TPB    = 177566          31#  4550*  4552*  16473*
TPS    = 177564          30#  4514*  4544   4554*  4596*  4611*  16471
TPSRVC  015532         4516   4609#
TPVEC  = 000064          128#  4516*  4518*  4592*  4594*
TRANS   061366         2131   2233   2317   2458*  2468   4541  16894#
TRAPVE= 000 34           126#   441*   442*
TRTVEC= 000014           121#
TSCANC  012230         3181   3183   3465#
TSCNCI  012246         3401   3403   3477#
TSKPC   011262         2897   2899   3154#
TSKPCI  011300         3089   3165#
TSPANC  013152         3494   3496   3772#
TSPNCI  013170         3708   3710   3784#
TSTCAS  000542          354#   967*   977   1301*  1584*  1594   1896*  2088*  2098   2420*  2615*  2624   2772*
                       2899*  2909   3058*  3183*  3193   3354*  3496*  3506   3664*  3803*  3813   3999*  4153*
                       4163   4346*  4757*  4767   5081*  5286*  5296   5665*  5850*  5860   6108*  6275*  6285
                       6584*  7022*  7032   7632*  7821*  7831   8355*  9290*  9320  10037* 10202* 10232  10956*
                      11121*  11139  11736* 11839* 11855  12650* 12862* 12892  13053* 13225* 13255  13422* 13595*
                      13613   14030* 14134* 14150  14603* 14799* 14829  14991* 15214* 15244  15411*
TYPE   = 104401          134#   478   15822  15828  15878  15890  16320  16353  16382  16388  16390  16398  16400
                      16449   16545  16586  16588  16592  16606  16618  16638  16688  16692  16697
TYPOC  = 104402          135#  16392  16590
TYPON  = 104404          137#
TYPOS  = 104403          136#  15824
VBIT   = 000002           58#   4803   4849   5333   5437   7285   8140  12018  12036  12456  12519  14396  14422
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XADDN   031766          9282#
XADDP   044520         12854#
XASHN   041404         11807   11831#
XASHP   050222         14102   14126#
XCMPC   013200          3766    3795#
XCMPN   037332         11113#
XCMPP   046624         13587#
XCVTLI  031264          8616    8646    8961#
XCVTLN  017436          5206    5278#
XCVTLP  016004          4749#
XCVTNL  022314          6201    6267#
XCVTNP  026432          7721    7813#
XCVTPL  021174          5771    5842#
XCVTPN  024346          6659    7014#
XDIVP   053226         15206#
XLOCC   007540          2556    2607#
XL2DR   001570           544#
XL3DR   002214           740     764#
XMATC   014244          4093    4145#
XMOVC   002612           950     959#
XMOVRC  004470          1435    1576#
XMOVTC  006102          2029    2080#
XMULP   052106         14791#
XSCANC  011304          3148    3175#
XSKPC   010422          2861    2891#
XSPANC  012256          3459    3488#
XSUBN   034542         10194#
XSUBP   045552         13217#
XXDP    000464           331#    465*    475
ZBIT  = 000004            57#    1030    1646    2141    4796    4824    5328    5397    5914    6339    7272    8127   11214
                        11335   11944   11976   11985   12043   12100   12208   12271   12305   12366   12429   12492   13684
                        13805   14284   14322   14341   14429
$APTHD  000300           277     283#
$ATYC   060156         16719   16721#
$ATY1   060132         16717#
$ATY3   060140         16435   16718#
$ATY4   060150         16358   16720#
$AUTOB  000422           308#    469*     473     480   16582
$BELL   000436           317#
$BGNLE= 177777             1#
$CHARC  057054         16450*  16460*  16467   16476*  16481#
$CKSWR  057312         16574#  16804
$CMTAG  000400           297#    429
$CNTLG  060103         16585   16707#
$CNTLU  060076         16605   16706#
$CPUOP  000656           409#
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$DEVCT  000640           400#
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$EOPCT 055230
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CROSS REFERENCE TABLE -- USER SYMBOLS

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0378

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0392

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0397

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4768	4770	4772	4774	4783	4785	4789	4792	4793	4797	4799	4800	4804
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CROSS REFERENCE TABLE -- USER SYMBOLS

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0407

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7238	7241	7242	7243	7251	7252	7253	7254	7257	7258	7267	7268	7269
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7576	7579	7580	7582	7583	7586	7587	7589	7590	7593	7594	7596	7597
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7624	7625	7638	7639	7642	7643	7663	7664	7667	7668	7670	7671	7672
7673	7674	7675	7676	7679	7680	7682	7683	7684	7685	7686	7687	7688
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7974	7975	7979	7980	7983	7984	7987	7988	7989	7990	7995	7996	7998
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0409

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11344	11360	11361	11364	11365	11376	11377	11382	11383	11386	11387	11388	11391
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11614	11618	11619	11622	11623	11624	11627	11628	11634	11635	11667	11668	11671
11672	11674	11675	11678	11679	11681	11682	11685	11686	11688	11689	11692	11693
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0417

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CROSS REFERENCE TABLE -- USER SYMBOLS


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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0431

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0434

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          16016#  16044#  16053#  16054#  16080#  16107#  16168#  16181#  16183#  16188#  16201#  16203#  16208#  16209#  16211#
          16218#  16219#  16221#  16232#
$$SETT    9498#   9499    9517#   9519    9535#   9537    9554#   9556    9576#   9578    9642#   9643    9661#   9663    9679#
          9681    9697#   9699    9719#   9721    9785#   9786    9809#   9811    9834#   9836    9859#   9861    9881#   9883
          10414#  10415   10433#  10435   10451#  10453   10470#  10472   10492#  10494   10560#  10561   10579#  10581   10597#
          10599   10615#  10617   10637#  10639   10703#  10704   10727#  10729   10752#  10754   10777#  10779   10799#  10801

. ABS.  070102      000


 ERRORS DETECTED:  0

 CJKDGA.BIN,CJKDGA.LST/CRF/SOL/NL:TOC=SPMAC.MLB/ML,SETUP,CJKDGA.P11,END
 RUN-TIME: 1604 1708 172 SECONDS
 RUN-TIME RATIO: 4143/3485=1.1
 CORE USED:  102K  (203 PAGES)
```